SUZUKI

GS500E

SERVICE MANUAL

99500-34069-01E

FOREWORD

The SUZUKI GS500E has been developed as a new generation motorcycle to the GS-models. It is packed with highly advanced design concepts including a New Twin Dome Combustion Chamber, a crankshaft couter-balancer, a fully transistorized ignition system and a link type rear suspension. Combined with precise control and easy handling the GS500E provides excellent performance and outstanding riding comfort.

This service manual has been produced primarily for experienced mechanics whose job is to inspect, adjust, repair and service SUZUKI motorcycles. Apprentice mechanics and do-it-yourself mechanics, will also find this manual an extremely useful repair guide. This manual contains the most up-to-date information at the time of publication. The rights are reserved to update or make corrections to this manual at any time.

SUZUKI MOTOR CORPORATION
Motorcycle Service Department

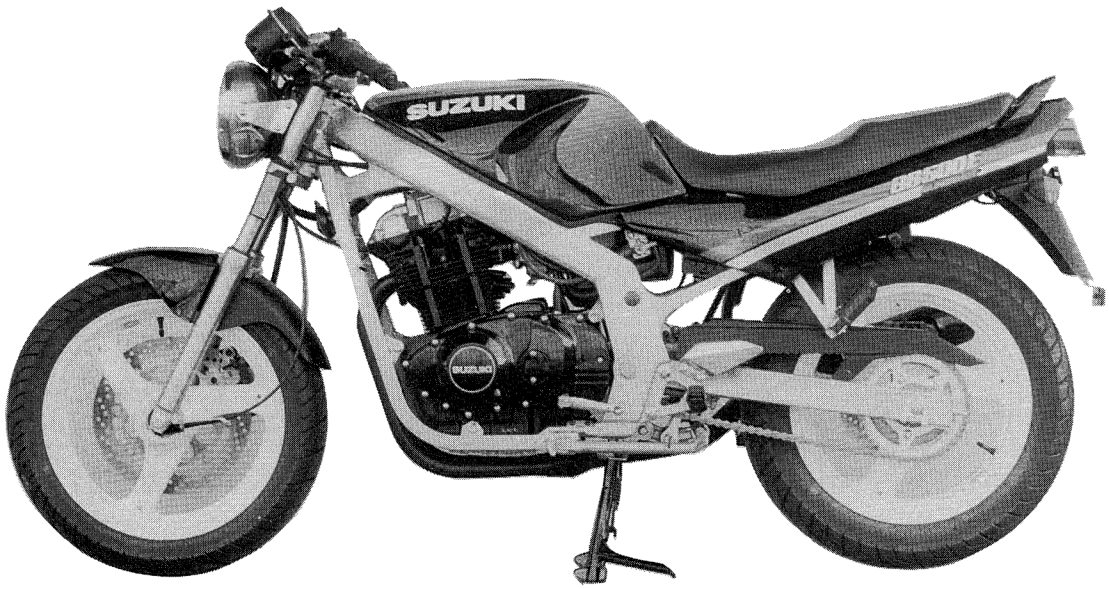
© COPYRIGHT SUZUKI MOTOR CORPORATION 1990

GROUP INDEX

GENERAL INFORMATION	1
PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES	2
ENGINE	3
FUEL AND LUBRICATION SYSTEM	4
ELECTRICAL SYSTEM	5
CHASSIS	6
SERVICE INFORMATION	7
GS500EL ('90-MODEL)	8
GS500EM ('91-MODEL)	9
GS500EN ('92-MODEL)	10
GS500EP ('93-MODEL)	11
GS500ER ('94-MODEL)	12
GS500ES ('95-MODEL)	13
GS500ET ('96-MODEL)	14
GS500EV ('97-MODEL)	15
GS500EW ('98-MODEL)	16
GS500EX ('99-MODEL)	17

VIEW OF GS500E

RIGHT SIDE



LEFT SIDE

Difference between photographs and actual motorcycle depends on markets.

GENERAL INFORMATION

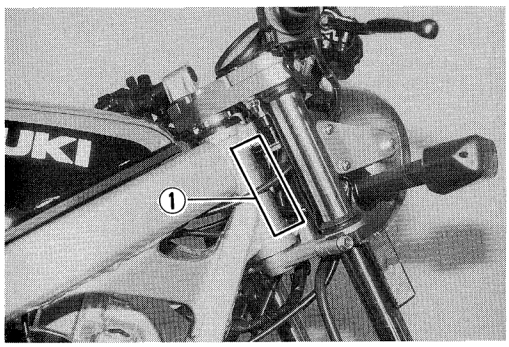
1

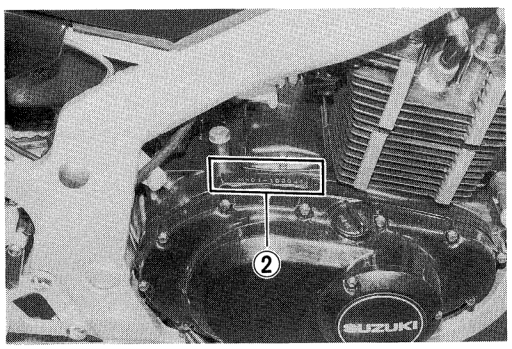
CONTENTS

SERIAL NUMBER LOCATIONS 1- 1
FUEL AND OIL RECOMMENDATIONS 1- 1
BREAK-IN PROCEDURES 1- 2
CYLINDER IDENTIFICATION 1- 2
SPECIAL MATERIALS 1- 3
PRECAUTIONS AND GENERAL INSTRUCTIONS 1- 5
SPECIFICATIONS 1- 7
COUNTRY OR AREA 1- 9

SERIAL NUMBER LOCATIONS

The frame number or V. I. N. (Vehicle Identification Number) ① is stamped on the right side of steering head pipe. The engine serial number ② is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.





FUEL AND OIL RECOMMENDATIONS

FUEL (For U.S.A. model)

1. Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octane ($\frac{R+M}{2}$)method or 89 octane or higher rated by the research method.
2. Suzuki recommends that customers use alcohol free, unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted provided that it contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with your fuel supplier to be sure that the fuel you intend to use meets the requirements listed above.

FUEL (For Canadian model)

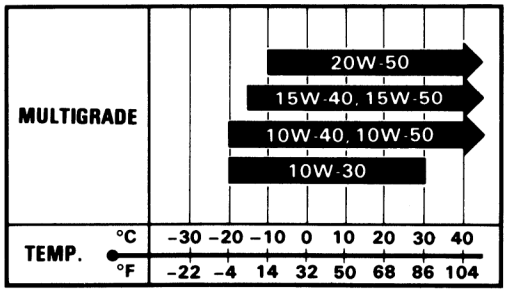
Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octane ($\frac{R+M}{2}$)method or 89 octane or higher rated by the research method.

FUEL (For the other models)

Gasoline used should be graded 85 — 95 octane (Research Method) or higher. An unleaded or low-lead gasoline type is recommended.

ENGINE OIL (For U.S.A. model)

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or an oil which is rated SE or SF under the API (American Petroleum Institute) classification system. The viscosity rating is SAE 10W/40. If an SAE 10W/40 motor oil is not available, select an alternate according to the following chart.



ENGINE OIL (For the other models)

Be sure that the engine oil you use comes under API (American Petroleum Institute) classification of SE or SF and that its viscosity rating is SAE 10W/40. If an SAE 10W/40 motor oil is not available, select an alternate according to the following chart.

FRONT FORK OIL

Use fork oil # 10.

BRAKE FLUID

Specification and classification: DOT 4

WARNING:

- *** Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.**
- *** Do not use any brake fluid taken from old or used or unsealed containers.**
- *** Never re-use brake fluid left over from the previous servicing and stored for a long period.**

BREAK-IN PROCEDURES

During manufacture, only the best possible materials are used and all machined parts are finished to a very high standard, but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows.

- Keep to these break-in engine speed limits.

Initial 800 km (500 miles) : Below 5 000 r/min
Up to 1 600 km (1 000 miles) : Below 8 000 r/min
Over 1 600 km (1 000 miles) : Below 10 000 r/min

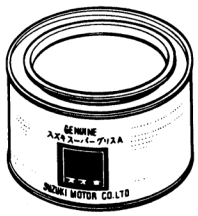
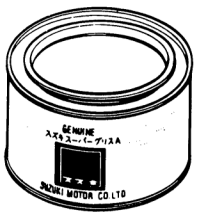
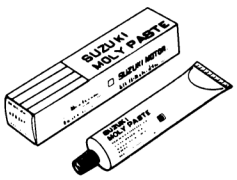
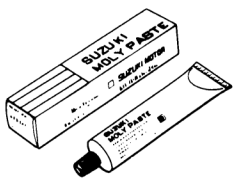
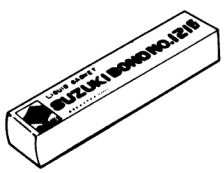
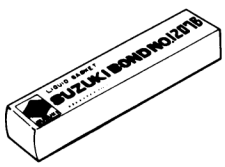
- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation.
  However, do not exceed red zone at any time.

CYLINDER IDENTIFICATION

The two cylinders of this engine are identified as left-hand and right-hand, as viewed by the rider on the seat.

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS500E, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

MATERIAL		PART	PAGE
For U.S.A. model	For other models		
 SUZUKI SUPER GREASE "A" 99000-25030	 SUZUKI SUPER GREASE "A" 99000-25010	• Driveshaft oil seal • Crankshaft oil seal • Oil filter • Starter motor oil seal • Wheel bearing • Steering stem bearing • Sprocket mounting drum bearing • Swingarm spacer and dust seal cover • Cushion lever bearing and dust seal • Cushion lever rod bearing and dust seal	3-43 3-53 2-10 5-11 6-4 6-33 6-21 6-34 6-48 6-48 6-48
SUZUKI SILICONE GREASE 99000-25100	SUZUKI SILICONE GREASE 99000-25100	• Brake caliper axle	6-7
 SUZUKI MOLY PASTE 99000-25140	 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Conrod big end bearing • Countershaft and driveshaft • Crankshaft journal bearing • Camshaft journal • Starter motor armature end • Counter-balancer journal	3-25 3-35 3-43 3-48 3-56 5-11 3-48
 SUZUKI BOND NO. 1207B 99104-31140	 SUZUKI BOND NO. 1207B 99000-31140	• Crankcase mating surface • Oil pressure switch • Cam end cap and cylinder head cover	3-48 3-53 3-59
THREAD LOCK SUPER "1303" 99000-32030	THREAD LOCK SUPER "1303" 99000-32030	• Cam sprocket bolt • Cam chain guide bolt and screw • 2nd drive gear • Gearshift cam retainer screw	3-28 3-29 3-43 3-51

MATERIAL		PART	PAGE
For U.S.A. model	For other models		
 THREAD LOCK "1360" 99000-32130	 THREAD LOCK "1360" 99000-32130	• Disc plate mounting bolt	6-5 6-35
 THREAD LOCK "1342" 99000-32050	 THREAD LOCK "1342" 99000-32050	• Gearshift cam stopper bolt • Oil pump mounting screw • Countershaft bearing retainer screw • Gearshift fork shaft stopper screw • Generator stator mounting screw • Generator lead wire guide securing screw • Starter motor mounting bolt • Oil separator plate mounting screw • Starter motor housing screw • Front fork damper rod bolt	3-51 3-52 3-51 3-46 5-7 5-7 3-49 3-47 5-11 6-17
 THREAD LOCK SUPER "1303" 99000-32030	 THREAD LOCK SUPER "1305" 99000-32100	• Generator rotor mounting bolt • Starter clutch allen bolt	3-50 3-41
 SUZUKI BRAKE FLUID DOT3 & DOT4 99000-23110	 SUZUKI BRAKE FLUID DOT3 & DOT4 99000-23110	• Brakes	2-14
 SUZUKI FORK OIL # 10 99000-99044-10G	 SUZUKI FORK OIL # 10 99000-99044-10G		6-17

MATERIAL		PART	PAGE
For U.S.A. model	For other models		
 THREAD LOCK CEMENT 99000-32040	 THREAD LOCK CEMENT 99000-32040	• Carburetor set plate screw	4-11

PRECAUTIONS AND GENERAL INSTRUCTIONS

Observe the following items without fail when servicing, disassembling and reassembling motorcycles.

□ Do not run engine indoors with little or no ventilation

□ Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

CAUTION:
Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.
When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.
After installing a circlip, always insure that it is completely seated in its groove and securely fitted.

□ Tighten cylinder head and case bolts and nuts beginning with larger diameter and ending with smaller diameter, and from inside to outside diagonally, to the specified tightening torque.

□ Use special tools where specified.

□ Use genuine parts and recommended oils.

□ When 2 or more persons work together, pay attention to the safety of each other.

□ After the reassembly, check parts for tightness and operation

□ Treat gasoline, which is extremely flammable and highly explosive, with greatest care. Never use gasoline as cleaning solvent.

Warning, Caution and Note are included in this manual occasionally, describing the following contents.

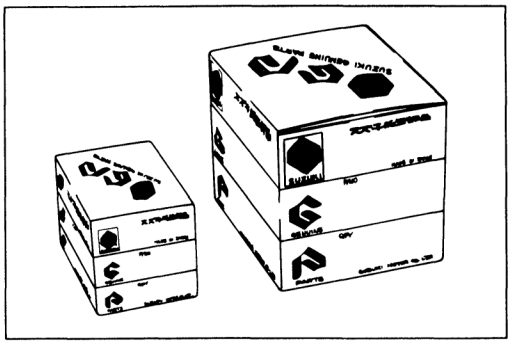
WARNING ..... The personal safety of the rider or bystanders may be involved. Disregarding this information could result in personal injury.
CAUTION ..... These instructions point out special service procedures or precautions that must be followed to avoid damaging the machine.
NOTE ..... This provides special information to make maintenance easier or important instructions clearer.

REPLACEMENT PARTS

When you replace any parts, use only genuine SUZUKI replacement parts, or their equivalent. Genuine SUZUKI parts are high quality parts which are designd and built specifically for SUZUKI vehicles.

CAUTION:

Use of replacement parts which are not equivalent in quality to genuine SUZUKI parts can lead to performance problems and damage.

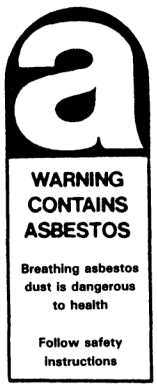


ASBESTOS INFORMATION

Note the following when handling a supply part with the above WARNING LABEL or any part in the parts list in this section which contains asbestos.

- Operate if possible out of doors in a well ventilated place.
- Preferably use hand tools or low speed tools equipped, if necessary, with an appropriate dust extractor facility. If high speed tools are used, they should always be so equipped.
- If possible, dampen before cutting or drilling.
- Dampen dust and place it in a properly closed receptacle and dispose of it safely.

Any domestic asbestos product to which the above does not apply, but which is likely to release fibres during use should be replaced by new one when worn.



1.	Breather cover gasket
2.	Clutch cover gasket
3.	Generator cover gasket
4.	Starter gear cover gasket
5.	Oil pan gasket
6.	Cam chain tension adjuster gasket

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 075 mm (81.7 in)
Overall width	725 mm (28.5 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	169 kg (373 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC, TDCC
Tappet clearance, IN & EX	0.03 – 0.08 mm (0.0018 – 0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu, in)
Compression ratio	9.0 : 1
Carburetor	MIKUNI BST33SS, twin
Air cleaner	Polyester fiber element
Starter system	Electric starter motor
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DID 520V6, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Link type suspension, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30′
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc
Rear brake	Disc
Front tire size	110/70 –17 54H, tubeless
Rear tire size	130/70 –17 62H, tubeless

ELECTRICAL

Ignition type	Fully Transistorized
Ignition timing	12° B.T.D.C. at 1 200 rpm and 40° B.T.D.C. at 4 000 rpm 5° B.T.D.C. at 1 200 rpm and 40° B.T.D.C. at 4 000 rpm ... California model only
Spark plug	NGK: DPR8EA-9 or ND: X24EPR-U9
Battery	12V 39.6 kC (11Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Parking light	12V 4W ... except for E-03, 28 and 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal)
reserve	3.5 L (3.7/3.1 US/Imp qt)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil	382 ml (12.9/13.5 US/Imp oz)

* These specifications are subject to change without notice.

COUNTRY OR AREA

The series of symbols on the left stand for the countries and areas on the right.

SYMBOL	COUNTRY or AREA
E-01	General
E-02	England
E-03	U.S.A.
E-04	France
E-15	Finland
E-16	Norway
E-17	Sweden
E-21	Belgium
E-22	W.Germany
E-24	Australia
E-25	Netherlands
E-28	Canada
E-33	California (U.S.A.)
E-34	Italy
E-39	Austria
E-53	Spain

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

CONTENTS

PERIODIC MAINTENANCE SCHEDULE 2- 1
- PERIODIC MAINTENANCE CHART 2- 1
- LUBRICATION POINTS 2- 2

MAINTENANCE AND TUNE-UP PROCEDURES 2- 3
- BATTERY 2- 3
- CYLINDER HEAD NUTS & EXHAUST PIPE BOLTS 2- 4
- AIR CLEANER 2- 5
- TAPPET CLEARANCE 2- 5
- SPARK PLUGS 2- 9
- FUEL LINE 2-10
- ENGINE OIL AND OIL FILTER 2-10
- CARBURETORS 2-11
- CLUTCH 2-11
- DRIVE CHAIN 2-12
- BRAKES 2-14
- TIRES 2-17
- STEERING 2-18
- FRONT FORKS 2-18
- REAR SUSPENSION 2-18
- CHASSIS BOLTS AND NUTS 2-19

PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometer, miles and time for your convenience.

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions however, it is not necessary for ensuring emission level compliance.

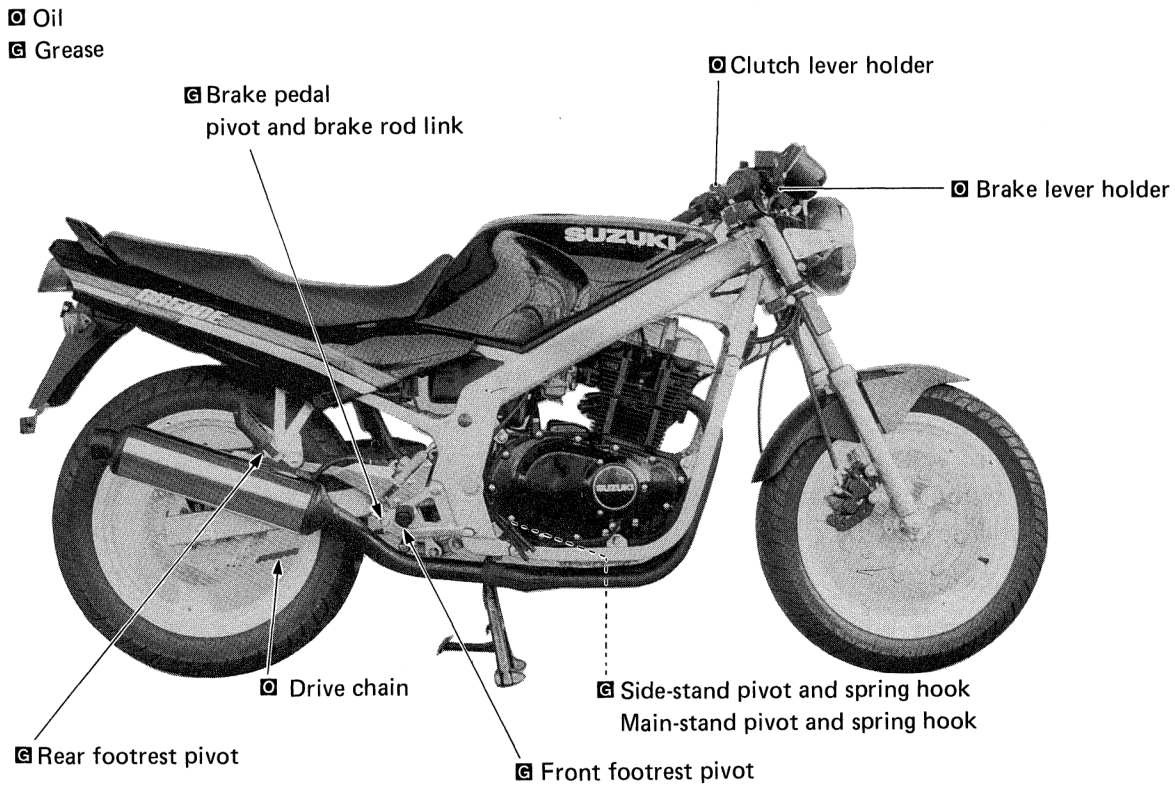
PERIODIC MAINTENANCE CHART

INTERVAL: **THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST**	km	1 000	6 000	12 000	18 000	24 000
	miles	600	4 000	7 500	11 000	15 000
	months	2	12	24	36	48
Battery (Specific gravity of electrolyte)		—	I	I	I	I
Cylinder head nuts & exhaust pipe bolts		T	T	T	T	T
Air cleaner element		Clean every 3 000 km (2 000 miles) and replace every 12 000 km (7 500 miles)				
Tappet clearance		I	I	I	I	I
Spark plugs		—	I	R	I	R
Fuel line (Vapor hose.....California model only)		I	I	I	I	I
		Replace every four years				
Engine oil and filter		R	R	R	R	R
Carburetors (Idle rpm)		I	I	I	I	I
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
		Clean and lubricate every 1 000 km (600 miles)				
Brake hoses		I	I	I	I	I
		Replace every four years				
Brake fluid		I	I	I	I	I
		Replace every two years				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering		I	I	I	I	I
Front forks		I	—	I	—	I
Rear suspension		I	—	I	—	I
Chassis bolts and nuts		T	T	T	T	T

NOTE: T = Tighten, I = Inspect, R = Replace

LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle. Major lubrication points are indicated below.



NOTE:

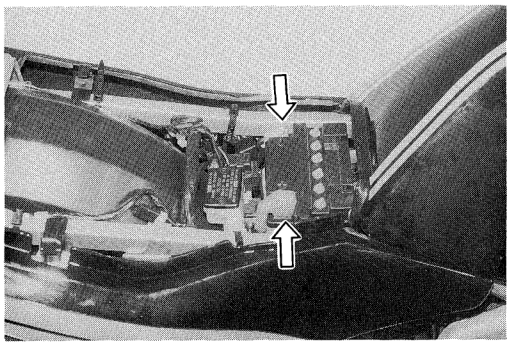
* *Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*
* *Lubricate exposed parts which are subject to rust, with oil or grease.*

MAINTENANCE AND TUNE-UP PROCEDURES

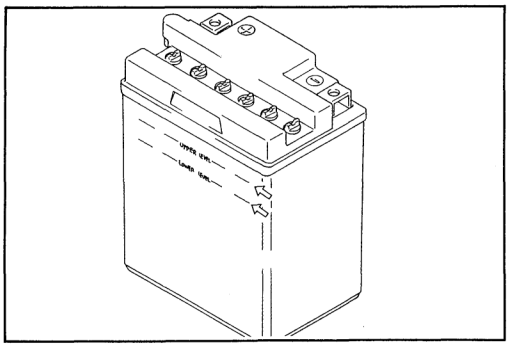
This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

BATTERY

Inspect Every 6 000 km (4 000 miles, 12 months).



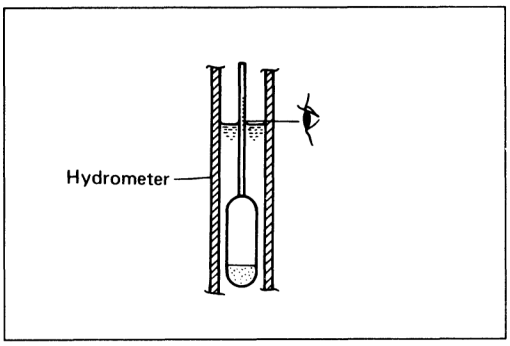
- Remove the seat.
- Remove the battery ⊖ and ⊕ lead wires from the battery terminals.
- Remove the battery from its frame.
- Check the electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the MIN. level line but not above the MAX. level line.
- For checking specific gravity, use a hydrometer to determine the charged condition.



09900-28403 : Hydrometer

Standard specific gravity : 1.28 at 20°C (68°F)

An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging. Remove the battery from the machine and charge it with a battery charger.

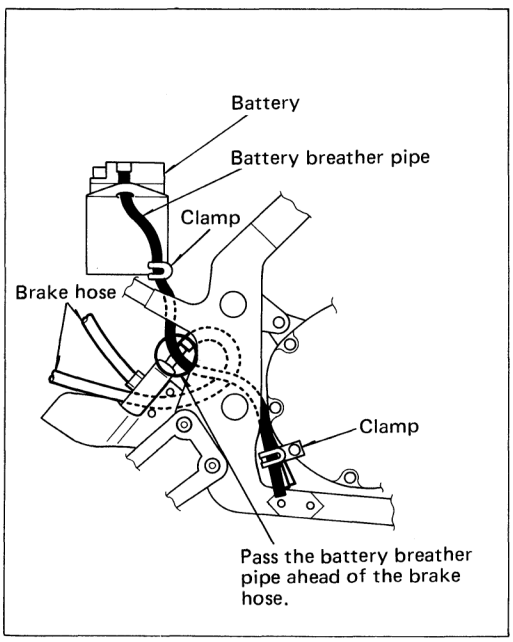


CAUTION:
Never charge a battery while still in the machine as damage may result to the battery or regulator/rectifier.

- Charge at a maximum of 1.2 amps.
- To install the battery, reverse the procedure described above.

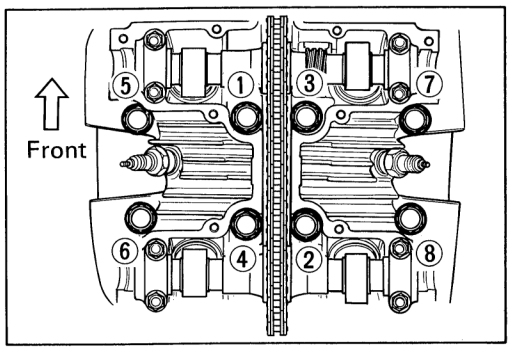
WARNING:
When installing the battery lead wires, fix the ⊕ lead first and ⊖ lead last.

- Make sure that the breather pipe is tightly secured and undamaged, and is routed as shown in the figure.



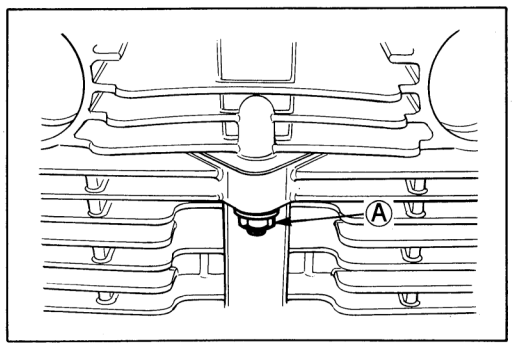
CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

Tighten at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.



CYLINDER HEAD

- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the cylinder head cover. (Refer to page 3-10.)
- First loosen and retighten the nuts to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.



Tightening torque
Cylinder head nut : 35 – 40 N·m (3.5 – 4.0 kg-m, 25.5 – 29.0 lb-ft)

- After firmly tightening the 8-nuts, tighten the nut (indicated as Ⓐ) to the torque value below:

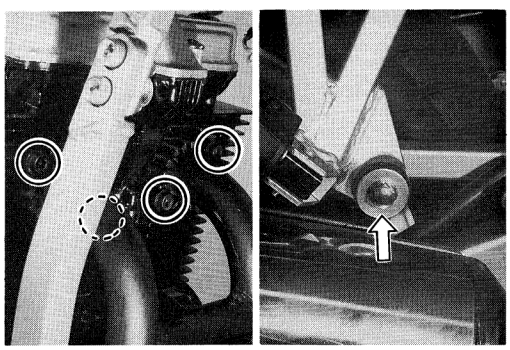
Tightening torque
Cylinder head nut Ⓐ: 7 – 11 N·m (0.7 – 1.1 kg-m, 5.0 – 8.0 lb-ft)

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-59.)
- Tighten the head cover bolts to the specified torque.

Tightening torque : 13 – 15 N·m (1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)

EXHAUST PIPE AND MUFFLER

- Tighten the exhaust pipe clamp bolts and muffler mounting bolt to the specified torque with a torque wrench.

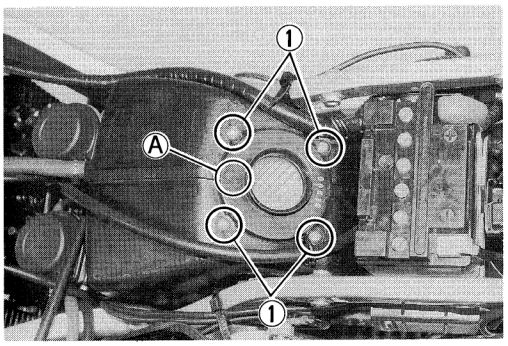


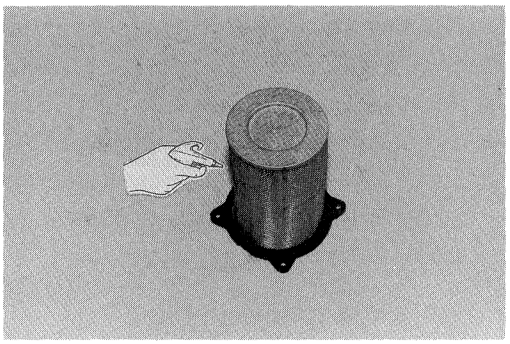
Tightening torque
Exhaust pipe bolt : 9 – 12 N·m (0.9 – 1.2 kg-m, 6.5 – 8.5 lb-ft)

Muffler mounting bolt : 18 – 28 N·m (1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

AIR CLEANER

Clean Every 3 000 km (2 000 miles) and Replace Every 12 000 km (7 500 miles).





- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the air cleaner element by removing four screws ①.
- Carefully use air hose to blow the dust from the cleaner element outside.

CAUTION:
Always use air pressure on the outside of the cleaner element. If air pressure is used on the inside, dirt will be forced into the pores of the cleaner element thus restricting air flow through the cleaner element.

- Reinstall the cleaned or new cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the arrow mark Ⓐ comes upward.

CAUTION:
If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component!

TAPPET CLEARANCE

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

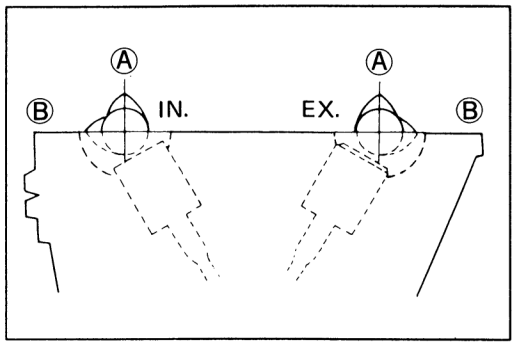
- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the signal generator cover.
- Remove the cylinder head cover. (Refer to page 3-10.)

The tappet clearance specification is the same for both intake and exhaust valves.
Tappet clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

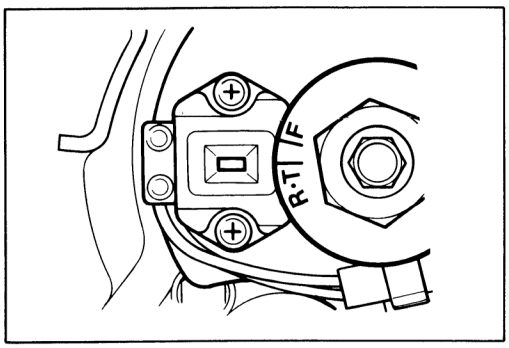
Tappet clearance (when cold) : IN. & EX. 0.03 – 0.08 mm (0.001 – 0.003 in)

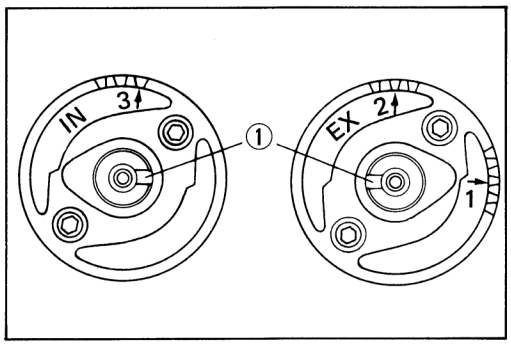
NOTE:

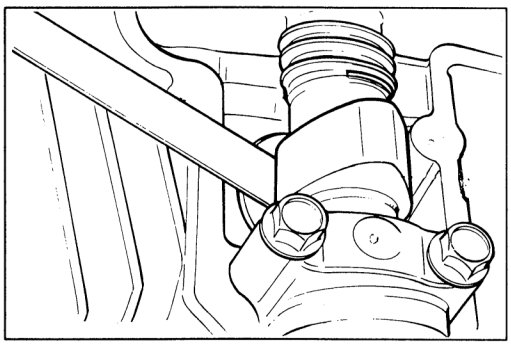
* *The cam must be at positions, Ⓐ or Ⓑ, in order to check the tappet clearance or to adjust tappet clearance. Clearance readings should not be taken with the cam in any other position than these two positions.*
* *The clearance specification is for COLD state.*
* *To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in the normal running direction. All spark plugs should be removed.*



- Turn crankshaft to bring the "R" and "T" marks on the rotor to the center of left pick-up coil and also to bring the notches ① in the right ends of both camshafts (Ex and In) to the positions shown. In this condition, read the tappet clearance at the valves Ⓒ (In and Ex of right cylinder, and In of left cylinder).





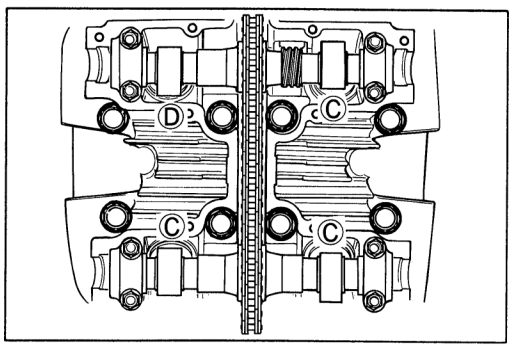


- Use thickness gauge between tappet and cam. If clearance is off the specification, bring it into the specified range with the special tool.

09900-20803 : Thickness gauge

- Turn the crankshaft 360° (one rotation) to bring the notches ① to the positions shown.
- Read the clearance at the remaining valve Ⓓ and adjust the clearance if necessary.

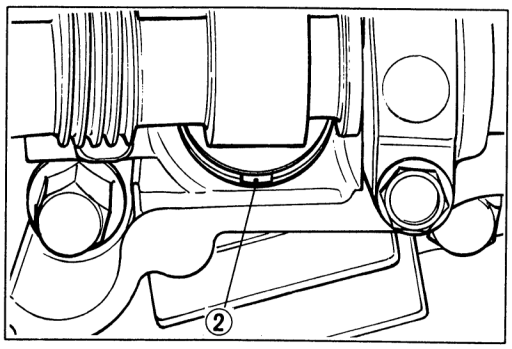
	Notch ① position	
Cam Position	Intake Camshaft	Exhaust Camshaft
Ⓒ	◒	◓
Ⓓ	◓	◒



TAPPET CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner shim.

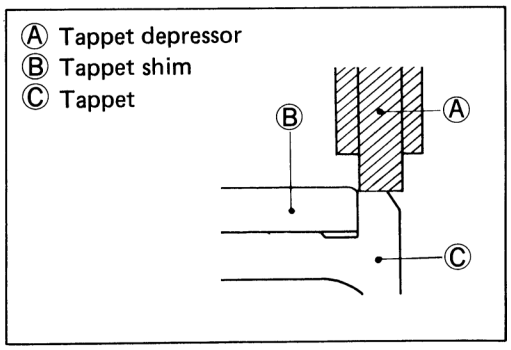
- Place a fingertip on the tappet, and turn it in place to bring notch ② to the position indicated.



- Push down the tappet by using the special tool.

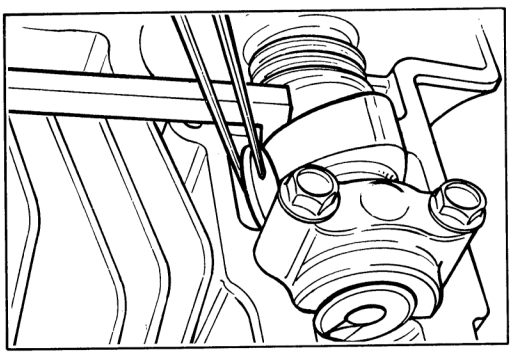
NOTE:
Make sure the tool exerts pressure on the tappet correctly, as shown.

09916-64510 : Tappet depressor

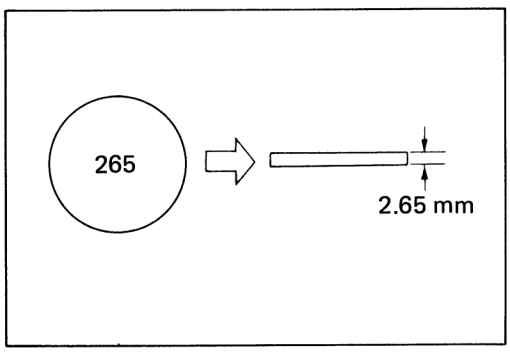


- Remove the tappet shim from the tappet.

09916-84510 : Tweezers



- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range (0.03 – 0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available ranging from 2.15 to 3.10 mm in steps of 0.05 mm. Fit the selected shim to the tappet, with numbers toward tappet. Be sure to check shim size with micrometer to insure its size.



NOTE:
* *Before fitting the tappet shim to the tappet, be sure to apply engine oil to its top and bottom faces.*
* *When seating tappet shim, be sure to face figure printed surface to the tappet.*

- After replacing the tappet shim, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.

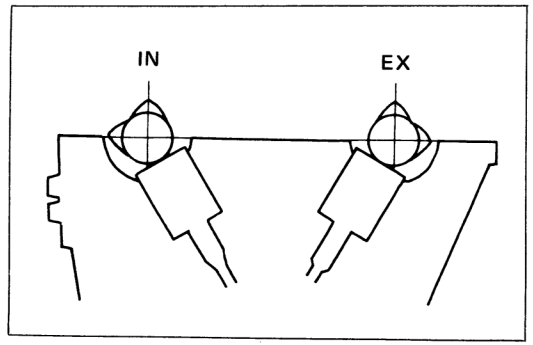
Tappet shim size chart

Thickness (mm)	Part No.
2.15	12892-45000-215
2.20	12892-45000-220
2.25	12892-45000-225
2.30	12892-45000-230
2.35	12892-45000-235
2.40	12892-45000-240
2.45	12892-45000-245
2.50	12892-45000-250
2.55	12892-45000-255
2.60	12892-45000-260
2.65	12892-45000-265
2.70	12892-45000-270
2.75	12892-45000-275
2.80	12892-45000-280
2.85	12892-45000-285
2.90	12892-45000-290
2.95	12892-45000-295
3.00	12892-45000-300
3.05	12892-45000-305
3.10	12892-45000-310

SHIM SELECTION CHART

PRESENT SHIM SIZE — mm

P/N SUFFIX-	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
Tappet Clearance (mm)	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10
0.00~0.02		2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05
0.03~0.08	SPECIFIED CLEARANCE: NO ADJUSTMENT REQUIRED																			
0.09~0.13	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	
0.14~0.18	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10		
0.19~0.23	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10			
0.24~0.28	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10				
0.29~0.33	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10					
0.34~0.38	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10						
0.39~0.43	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10							
0.44~0.48	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10								
0.49~0.53	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10									
0.54~0.58	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10										
0.59~0.63	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10											
0.64~0.68	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10												
0.69~0.73	2.80	2.85	2.90	2.95	3.00	3.05	3.10													
0.74~0.78	2.85	2.90	2.95	3.00	3.05	3.10														
0.79~0.83	2.90	2.95	3.00	3.05	3.10															
0.84~0.88	2.95	3.00	3.05	3.10																
0.89~0.93	3.00	3.05	3.10																	
0.94~0.98	3.05	3.10																		
0.99~1.03	3.10																			



I. Measure the tappet clearance. "ENGINE is COLD"
II. Measure the existing shim size.
III. Match the clearance in vertical column with existing shim size in horizontal column.

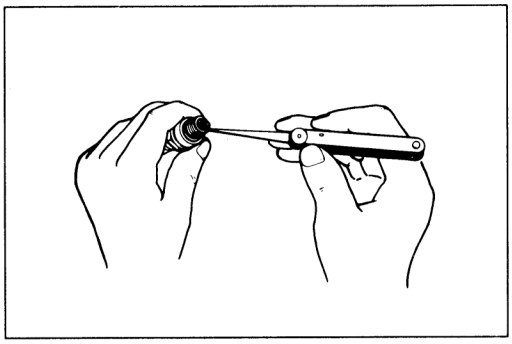
EXAMPLE:
Tappet clearance — 0.55 mm
Existing shim size — 2.40 mm
Shim size to be used — 2.90 mm

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-59.)
- Tighten the cylinder head cover bolts to the specified torque.

Tightening torque : 13 — 15 N·m
(1.3 — 1.5 kg-m, 9.5 — 11.0 lb-ft)

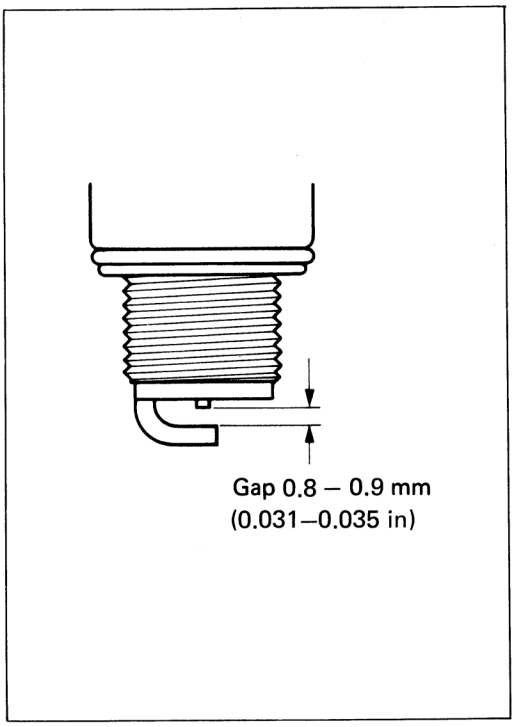
SPARK PLUGS

Inspect 6 000 km (4 000 miles, 12 months), 18 000 km (11 000 miles, 36 months) and Replace Every 12 000 km (7 500 miles, 24 months).



- Remove the spark plugs by using the spark plug wrench.

The spark plug gap is correctly adjusted to 0.8 — 0.9 mm (0.031 — 0.035 in) by using a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using a tool with a pointed end. If the electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.
NGK DPR8EA-9 or N.D. X24EPR-U9 should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need to be replaced, it is recommended that ones having a heat range closest to the standard plug as shown below. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are apt to get wet (blackened by carbon), they should be replaced by a hot type and if baked white, by a cold type.



09930-10120 : Spark plug wrench set
09900-20803 : Thickness gauge

CAUTION:
Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

NOTE:
"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.

Recommended spark plug

	NGK	N.D.
Standard	DPR8EA-9	X24EPR-U9
Hot type	DPR7EA-9	X22EPR-U9
Cold type	DPR9EA-9	X27EPR-U9

FUEL LINE

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months). Replace Every four years.

VAPOR HOSE ..... CALIFORNIA MODEL ONLY

ENGINE OIL AND OIL FILTER

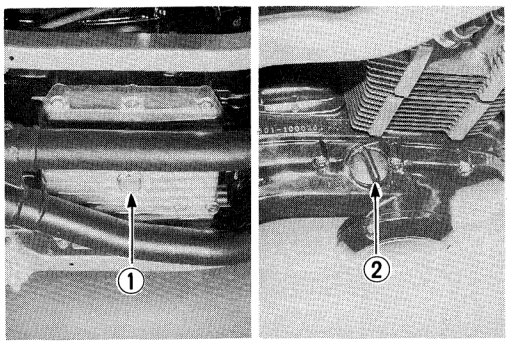
Replace at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

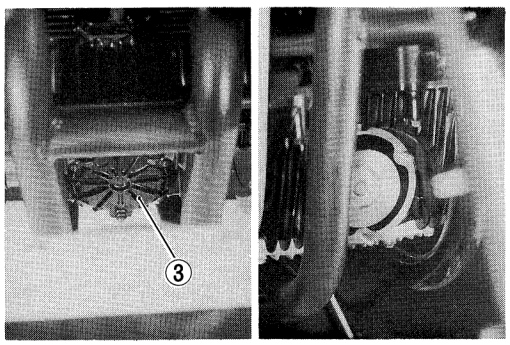
Oil should be changed while the engine is hot. Oil filter replacement at the above intervals should be done together with engine oil change.

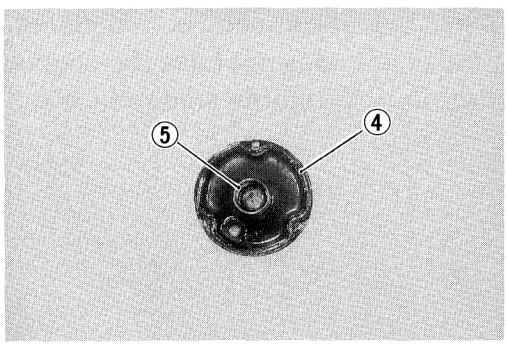
- Keep the motorcycle upright.
- Place an oil pan below the engine and drain oil by removing the drain plug ① and filler cap ②.
- Remove the oil filter cap ③ by removing the three nuts.
- Replace the oil filter with new one.

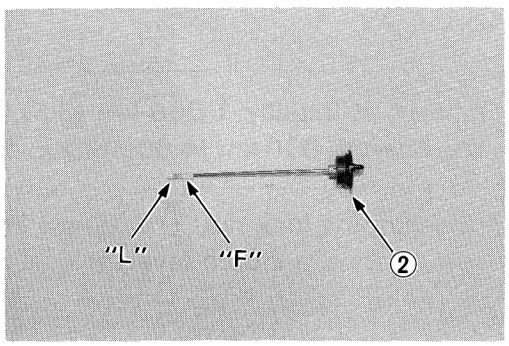
NOTE:
Be sure to take care of O-ring ④ to prevent any damage and be sure that filter spring ⑤ is properly in place.

- Apply grease lightly to the O-ring ④ of the oil filter cap ③ before installation.
- Fit the drain plug ① securely, and add fresh oil through the oil filler. The engine will hold about 2.9 L (3.1 US qt) of oil. Use an API classification of SE or SF oil with SAE 10 W/40 viscosity.
- Install the filler cap ②.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level by removing the filler cap ②. If the level is below mark "F", add oil to that level.









NECESSARY AMOUNT OF ENGINE OIL

Oil change	2.6 L (2.7 US qt)
Filter change	2.9 L (3.1 US qt)
Overhaul engine	3.2 L (3.4 US qt)

CARBURETORS

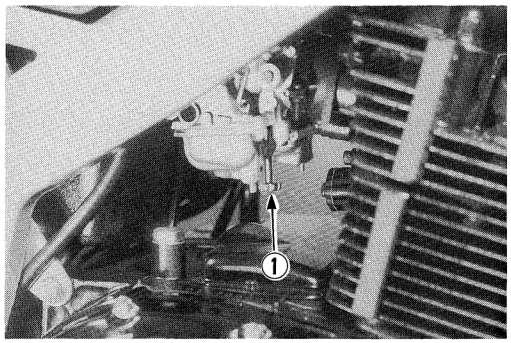
IDLE R/MIN. (Idling adjustment)

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

NOTE:
Make this adjustment when the engine is hot.

- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1 000 and 1 300 r/min by turning throttle stop screw ①.

Engine idle speed : 1 200 ± 100 r/min

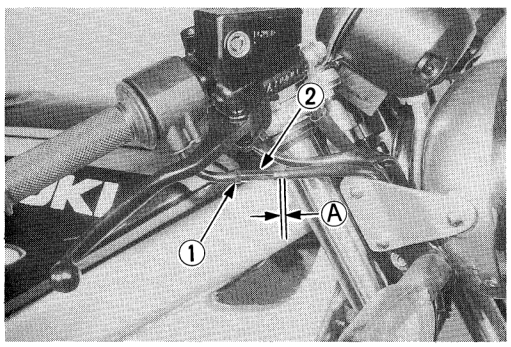


THROTTLE CABLE PLAY

There should be 0.5 — 1.0 mm (0.02 — 0.04 in) play Ⓐ on the throttle cable.
Adjust the throttle cable play in following procedures.

- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster.

Throttle cable play Ⓐ : 0.5 — 1.0 mm (0.02 — 0.04 in)

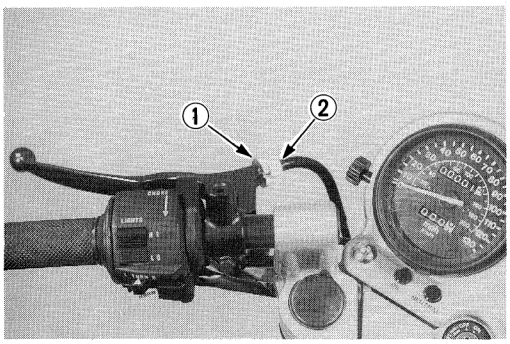


WARNING:
After the adjustment is completed, check that handlebar movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.

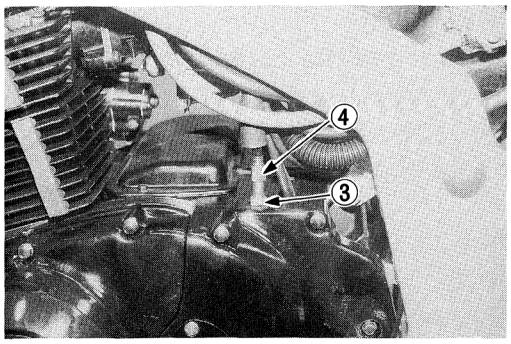
CLUTCH

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

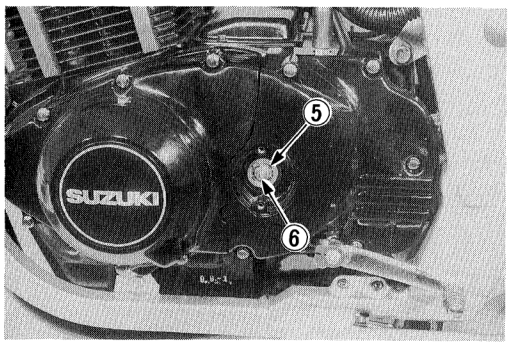
- Loosen the lock nut ① and turn in the adjuster ② all the way into the clutch lever holder.



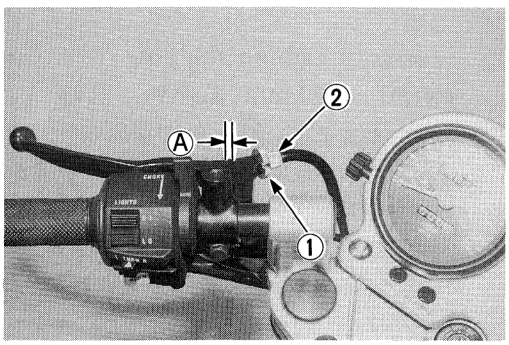
- Loosen the lock nut ③ and, if required, turn the adjuster ④ in place to introduce some play in the clutch lever.
- Remove the clutch release cover.



- Loosen the lock nut ⑤ and back the adjusting screw ⑥ out two or three rotations.
- Slowly turn the adjusting screw in until it begins to meet high resistance to turning.
  From this position, back it out 1/4 – 1/2 rotation and secure the lock nut ⑤.

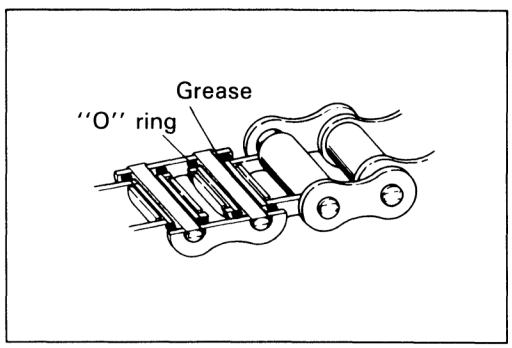


- Reset the adjuster ④ to provide a clutch lever play Ⓐ of 4 mm (0.16 in), and tighten the lock nut ③.
- Lock the adjuster ② using lock nut ①.



DRIVE CHAIN

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter. Clean and Lubricate Every 1 000 km (600 miles).



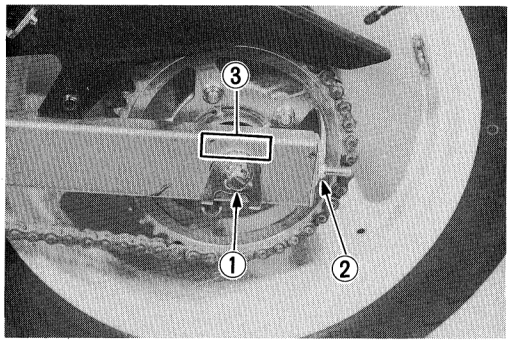
Visually check the drive chain for the listed below possible defects. (Support the motorcycle by center stand, and turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

* Loose pins
* Damaged rollers
* Dry or rusted links
* Kinked or binding links
* Excessive wear
* Improper chain adjustment
* Missing O-ring seals

If any defects are found, the drive chain must be replaced.

CHECKING

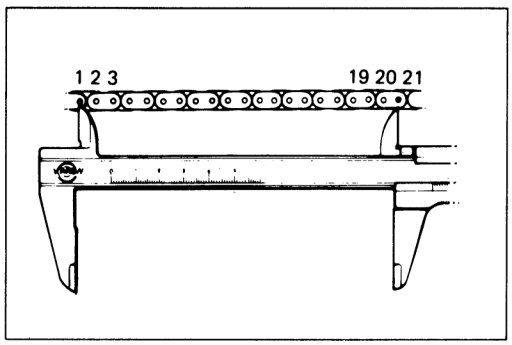
- Remove the cotter pin. (For E-03, 28 and 33 models)
- Loosen the axle nut ①.
- Tension the drive chain fully by tightening the chain adjusting nuts ②, left and right.



E-03 : U.S.A.
E-28 : Canada
E-33 : California (U.S.A.)

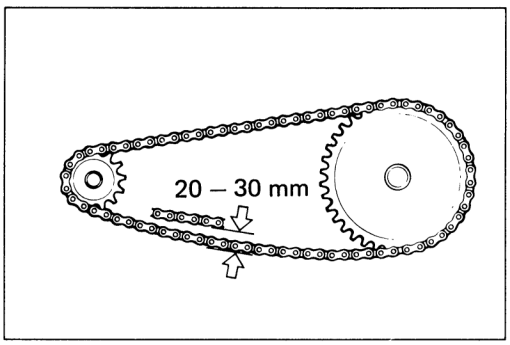
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds following limit, the chain must be replaced.

Service Limit : 319.4 mm (12.57 in)



ADJUSTING

- Loosen or tighten the chain adjusting nuts ② until the chain has 20 – 30 mm (0.8 – 1.2 in) of slack at the middle between engine and rear sprockets. The mark ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.
  Place on side stand for accurate adjustment.
- After adjusting the drive chain slack, tighten the axle nut ① securely.
- Tighten the chain adjusting nuts securely.



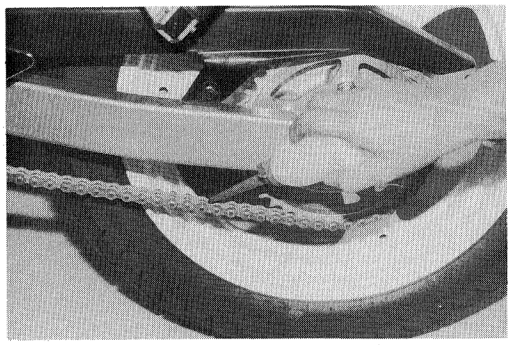
Tightening torque (Rear axle nut):
Normal nut with cotter pin
50 – 80 N·m
(5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft)
Self-lock nut
60 – 96 N·m
(6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft)

CLEANING AND LUBRICATING

- Wash the chain with kerosene. If the chain tends to rust faster, the intervals must be shortened.

CAUTION:
Do not use trichlene, gasoline or any similar fluids. These fluids have too great a dissolving power for this chain and, what is more important, can damage the "O" rings (or seals) confining the grease in the bush to pin clearance. Remember, high durability comes from the presence of grease in that clearance.

- After washing and drying the chain, oil it with a heavy-weight motor oil.

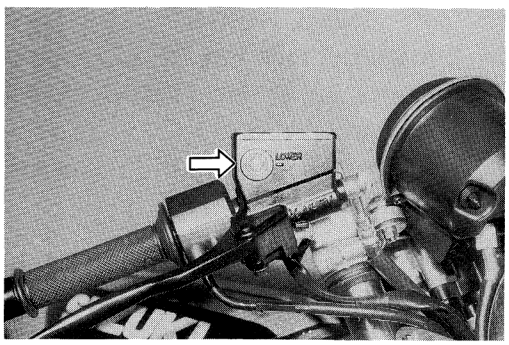


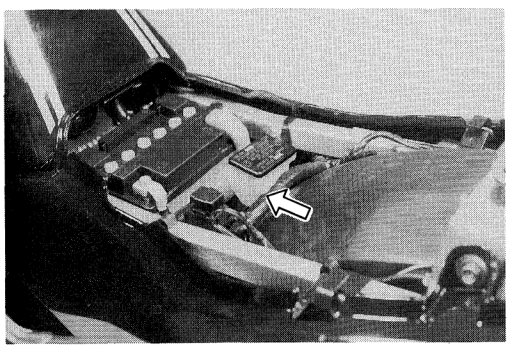
CAUTION:

* **Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O" rings (or seals).**
* **The standard drive chain is DAIDO D.I.D 520V6-110 links. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.**

BRAKES

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.
Replace hoses Every four years.
Change fluid Every two years.





BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the upper (Only for rear brake) and lower (Both front and rear brake) limit lines on the brake fluid reservoirs.

Specification and Classification : DOT4

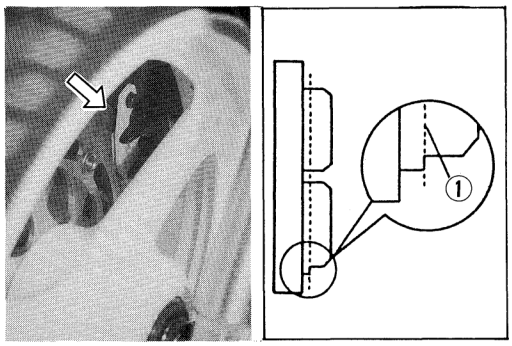
99000-23110 : SUZUKI BRAKE FLUID DOT 3 & DOT 4

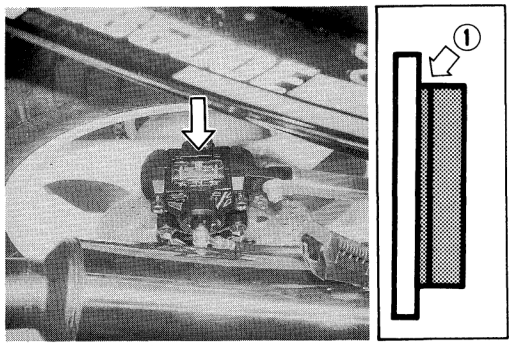
WARNING:
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for long periods.

WARNING:
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces.
Check the brake hoses and hose joints for cracks and oil leakage before riding.

BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. (Refer to pages 6-9 and 6-24.)

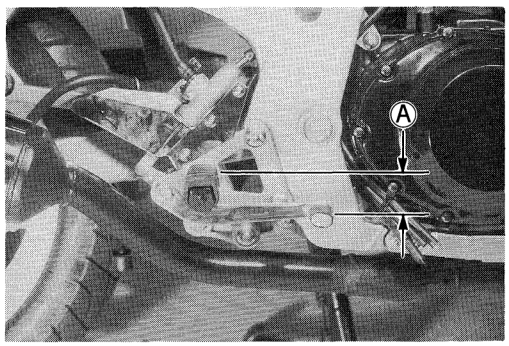


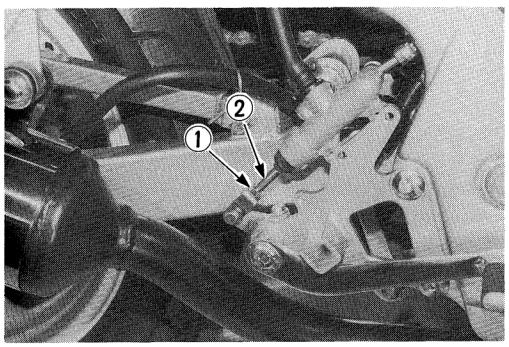


BRAKE PEDAL HEIGHT

- Loosen the lock nut ①, and rotate the push rod ② to locate brake pedal 47 mm (1.9 in) Ⓐ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

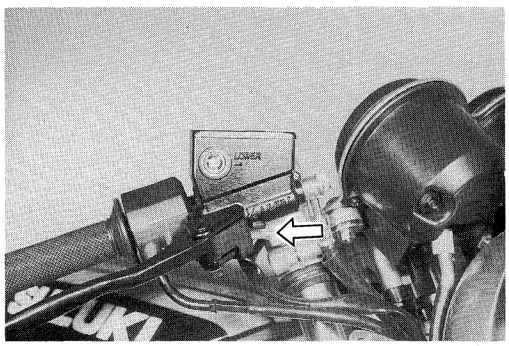
Brake pedal height Ⓐ : 47 mm (1.9 in)

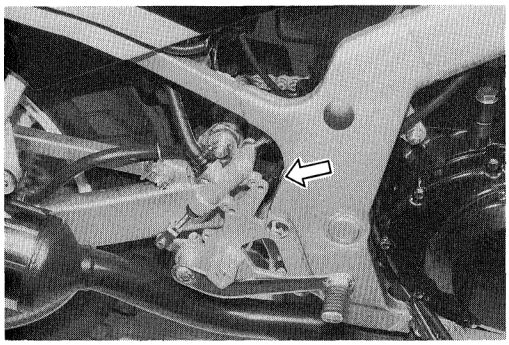




BRAKE LIGHT SWITCHES

Adjust both brake light switches, front and rear, so that the brake light will come on just before a pressure is felt when the brake lever is squeezed, or the brake pedal is depressed.

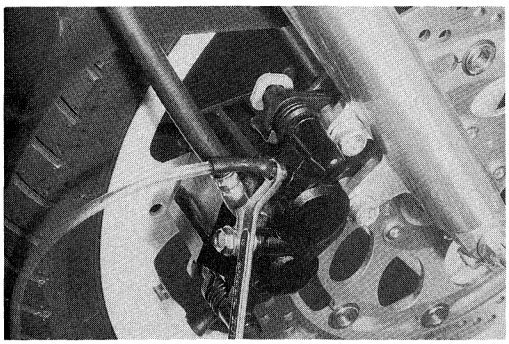




AIR BLEEDING FROM THE BRAKE FLUID CIRCUIT

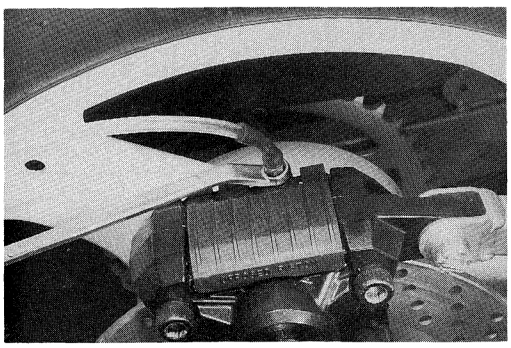
Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by "sponginess" of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

- Fill up the master cylinder reservoirs to the upper end of the inspection window, (for front brake) and "UPPER" line (for rear brake).
  Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.



Tightening torque (Bleeder valve) :
6 – 9 N·m
(0.6 – 0.9 kg-m, 4.5 – 6.5 lb-ft)

- Squeeze and release the brake lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle; this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.



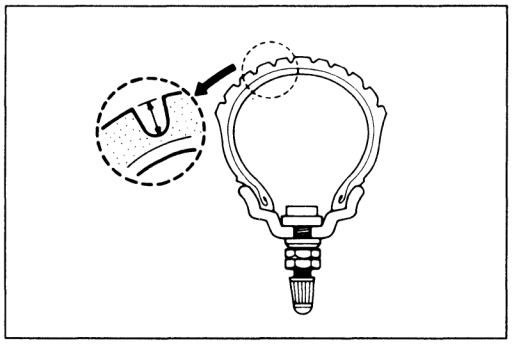
NOTE:
Replenish the brake fluid reservoir as necessary while bleeding the brake system.
Make sure that there is always some fluid visible in the reservoir.

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window, (for front brake) and "UPPER" line (for rear brake).

CAUTION:
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.

The only difference between bleeding the front and rear brakes is that the rear master cylinder is actuated by a pedal.

TIRES



Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

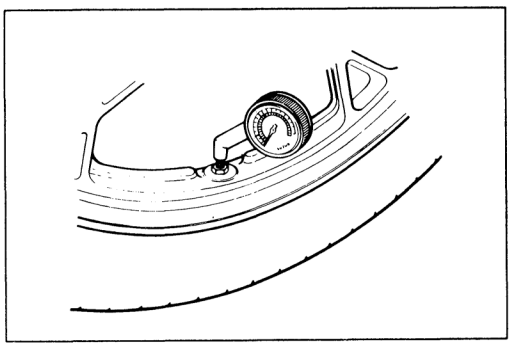
Tire tread depth limit
Front : 1.6 mm (0.06 in)
Rear : 2.0 mm (0.08 in)

TIRE PRESSURE

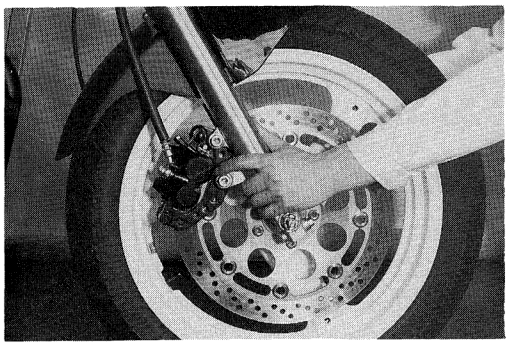
If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result.
Cold inflation tire pressure is as follows.

	FRONT			REAR		
	kg/cm^2	kPa	psi	kg/cm^2	kPa	psi
Solo riding	2.25	225	33	2.50	250	36
Dual riding	2.25	225	33	2.80	280	41

CAUTION:
The standard tire fitted on this motorcycle is 110/70 –17 54H (BRIDGESTONE G547G) for front and 130/70 –17 62H (BRIDGESTONE G550) for rear. The use of tires other than the those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.



STEERING



Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

Taper roller type bearings are used on the steering system for better handling.
Steering should be adjusted properly for smooth turning of handlebars and safe running. Over tight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability.
Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 6-19 of this manual.

FRONT FORKS

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary.
(Refer to page 6-13.)

REAR SUSPENSION

Inspect at Initially 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

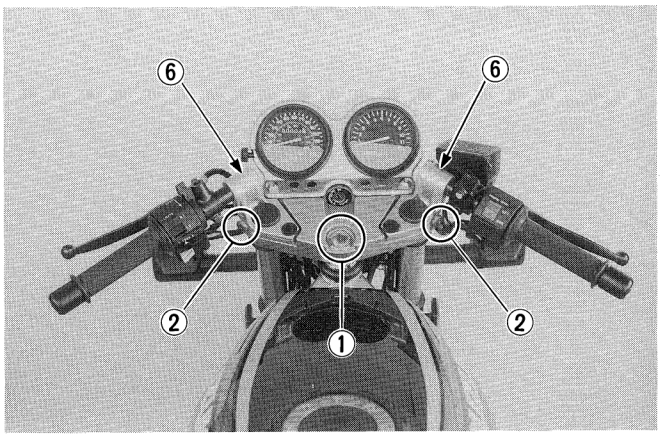
Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

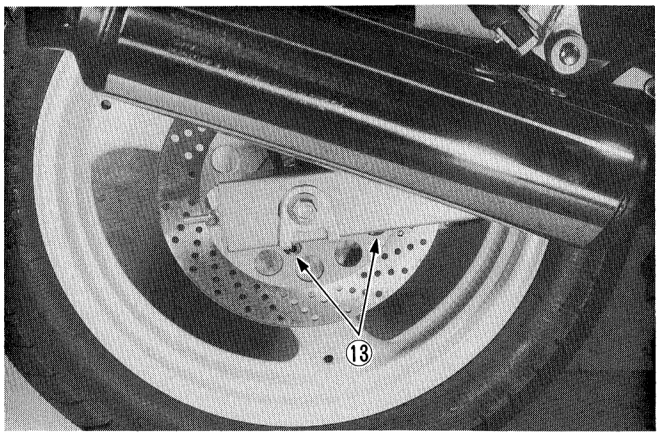
CHASSIS BOLTS AND NUTS

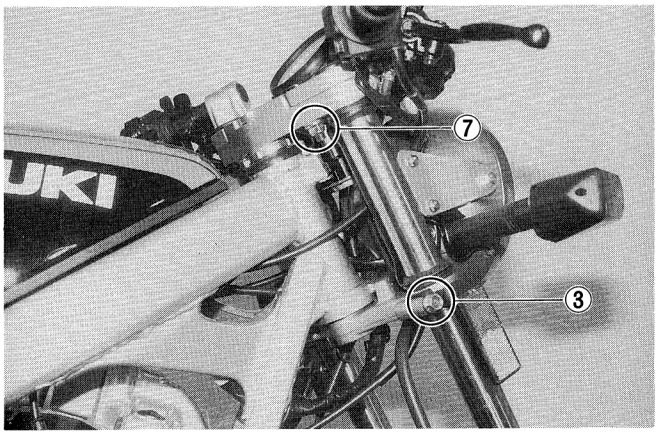
Tighten at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months).

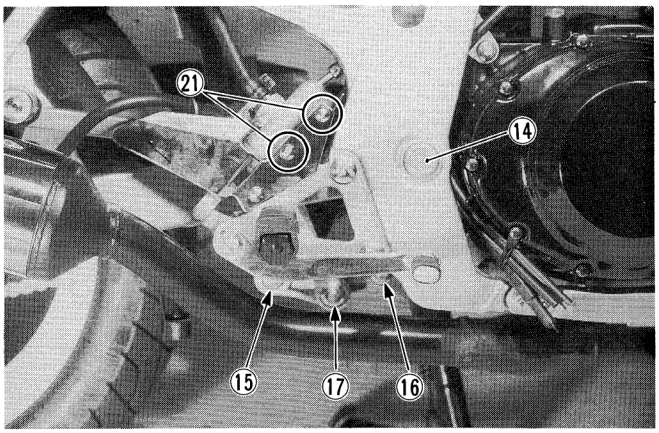
The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-20 for the locations of the following nuts and bolts on the motorcycle.)

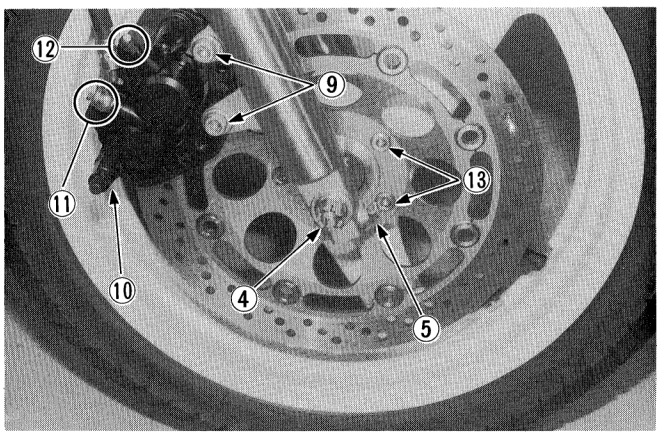
Item		N·m	kg-m	lb-ft
① Steering stem head bolt		35 – 55	3.5 – 5.5	25.5 – 40.0
② Front fork upper clamp bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
③ Front fork lower clamp bolt		25 – 40	2.5 – 4.0	18.0 – 29.0
④ Front axle nut	Normal nut with cotter pin	36 – 52	3.6 – 5.2	26.0 – 37.5
	Self-lock nut	40 – 58	4.0 – 5.8	29.0 – 42.0
⑤ Front axle pinch bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
⑥ Handlebar set bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
⑦ Handlebar holder mounting nut		27 – 42	2.7 – 4.2	19.5 – 30.5
⑧ Front brake master cylinder mounting bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
⑨ Front brake caliper mounting bolt		30 – 48	3.0 – 4.8	21.5 – 35.0
⑩ Front brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
⑪ Brake hose union bolt		15 – 20	1.5 – 2.0	11.0 – 14.5
⑫ Air bleeder valve		6 – 9	0.6 – 0.9	4.5 – 6.5
⑬ Front and rear disc bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
⑭ Swingarm pivot nut		55 – 88	5.5 – 8.8	40.0 – 63.5
⑮ Rear shock absorber upper/lower mounting nut		40 – 60	4.0 – 6.0	29.0 – 43.5
⑯ Rear cushion lever mounting nut		70 – 100	7.0 – 10.0	50.5 – 72.5
⑰ Rear cushion lever rod mounting nut (Upper & Lower)		70 – 100	7.0 – 10.0	50.5 – 72.5
⑱ Rear brake caliper mounting bolt		20 – 31	2.0 – 3.1	14.5 – 22.5
⑲ Rear brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
⑳ Torque link nut (Front & Rear)		22 – 35	2.2 – 3.5	16.0 – 25.5
㉑ Rear brake master cylinder mounting bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
㉒ Rear axle nut	Normal nut with cotter pin	50 – 80	5.0 – 8.0	36.0 – 58.0
	Self-lock nut	60 – 96	6.0 – 9.6	43.5 – 69.5
㉓ Rear sprocket nut		40 – 60	4.0 – 6.0	29.0 – 43.5

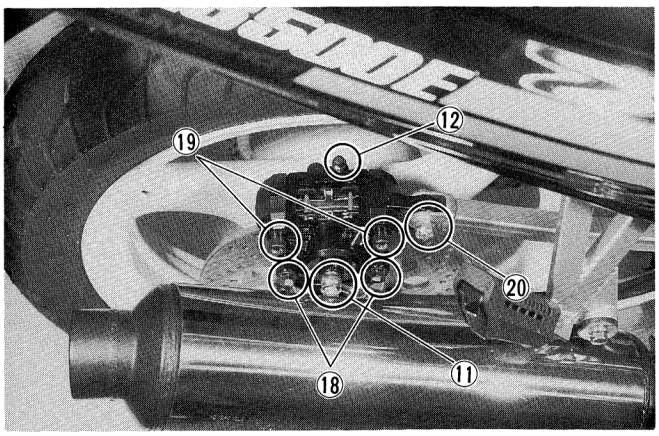

6
6
2
1
2

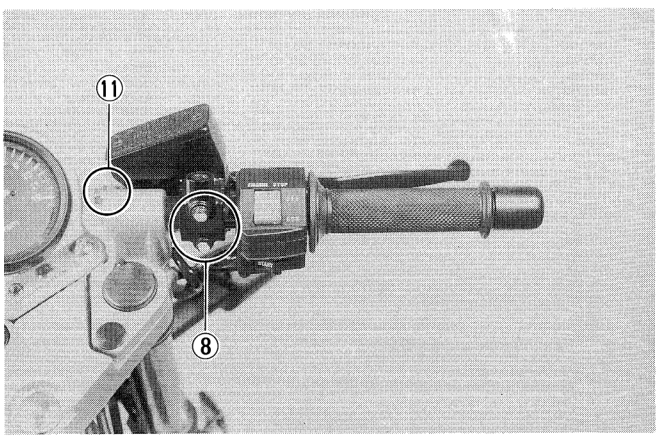

13

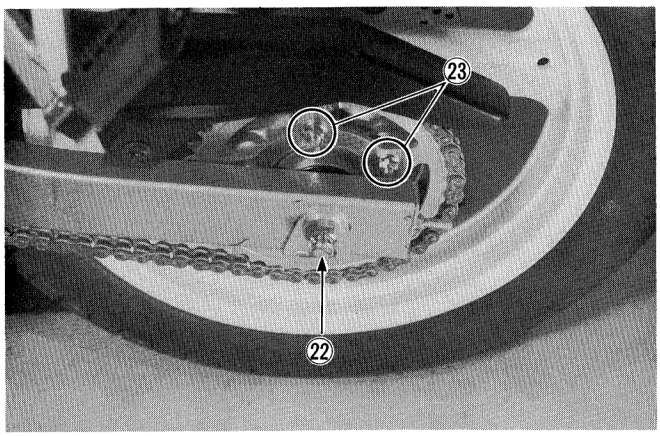

7
3


21
14
15
17
16


12
9
11
13
10
4
5


19
12
20
18
11


11
8


23
22

ENGINE

CONTENTS

COMPRESSION PRESSURE CHECK 3- 1
COMPRESSION TEST PROCEDURE 3- 1
OIL PRESSURE CHECK 3- 2
OIL PRESSURE TEST PROCEDURE 3- 2
ENGINE COMPONENTS REMOVABLE
WITH ENGINE IN PLACE 3- 3
ENGINE REMOVAL AND REINSTALLATION 3- 4
ENGINE REMOVAL 3- 4
ENGINE REINSTALLATION 3- 9
ENGINE DISASSEMBLY 3-10
ENGINE COMPONENTS INSPECTION AND SERVICE 3-19
CYLINDER HEAD 3-19
VALVES 3-20
CAMSHAFTS 3-26
CAM CHAIN TENSIONER 3-28
CYLINDER 3-29
PISTONS 3-30
PISTON RINGS 3-31
PISTON PINS 3-32
CONRODS 3-32
CRANKSHAFT AND COUNTER-BALANCER SHAFT 3-36
COUNTER-BALANCER SHAFT 3-38
CLUTCH 3-40
STARTER CLUTCH 3-41
OIL PUMP 3-41
TRANSMISSION GEARS 3-42
ENGINE REASSEMBLY 3-46

COMPRESSION PRESSURE CHECK

The compression of a cylinder is a good indicator of its internal condition.
The decision to overhaul the cylinder is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

COMPRESSION PRESSURE SPECIFICATION

Standard	Limit	Difference
1 000-1 400 kPa (10-14 kg/cm²) (142-199 psi)	800 kPa (8 kg/cm²) (114 psi)	200 kPa (2 kg/cm²) (28 psi)

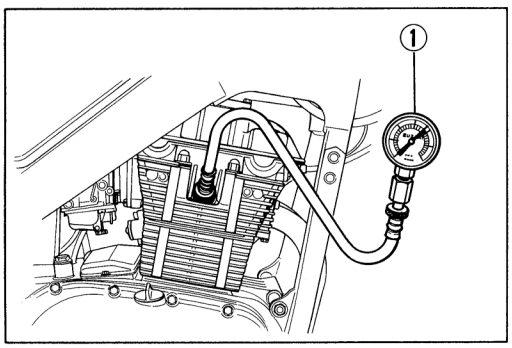
Low compression pressure can indicate any of the following conditions:
* Excessively worn cylinder wall
* Worn-down piston or piston rings
* Piston rings stuck in the grooves
* Poor seating of valves
* Ruptured or otherwise defective cylinder head gasket

Overhaul the engine in the following cases:
* Compression pressure in one of the cylinders is less than 800 kPa (8 kg/cm², 114 psi).
* Difference in compression pressure between two cylinders is more than 200 kPa (2 kg/cm², 28 psi).
* Both compression pressure are below 1 000 kPa (10 kg/cm², 142 psi) even when they measure more than 800 kPa (8 kg/cm², 114 psi).

COMPRESSION TEST PROCEDURE

NOTE:
* *Before testing the engine for compression pressure, make sure that the cylinder head nuts and bolts are tightened to the specified torque values and valves are properly adjusted.*
* *Have the engine warmed up by idling before testing.*

Remove the parts concerned and test the compression pressure in the following manner.
- Remove the spark plugs.
- Fit the compression gauge ① one of the plug holes, taking care to make the connection tight.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with the other cylinder.



09915-64510 : Compression gauge
09915-63210 : Adaptor

OIL PRESSURE CHECK

To check periodically oil pressure of the oil passage way in the engine needs to judge roughly the conditions of the moving parts.

OIL PRESSURE SPECIFICATION

Above 200 kPa (2.0 kg/cm^2, 28 psi) **Below 500 kPa (5.0 kg/cm^2, 71 psi)**	**at 3 000 r/min., Oil temp. at 60°C (140°F)**

If the oil pressure is lower or higher than the specification, the following causes may be considered.

LOW OIL PRESSURE

* Clogged oil filter
* Oil leakage from oil passage way
* Damaged oil seal
* Defective oil pump
* Combination of above items

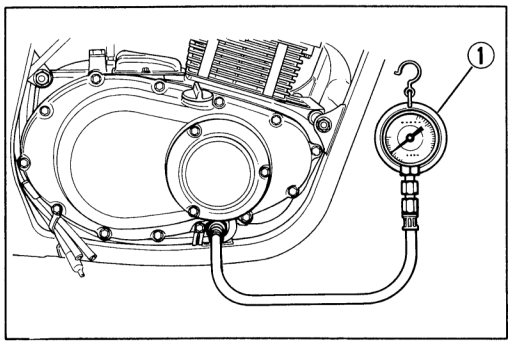
HIGH OIL PRESSURE

* Used a engine oil which is too heavy a weight
* Clogged oil passage way
* Combination of above items

OIL PRESSURE TEST PROCEDURE

Start the engine and check if the oil pressure indicator light is turned on. If it keeps on lighting, check the oil pressure indicator light circuit. If it is in good condition, check the oil pressure in the following manner.

- Install the oil pressure gauge ① in the position shown in the figure.
- Warm up the engine as follows:
  Summer 10 min. at 2 000 r/min.
  Winter 20 min. at 2 000 r/min.
- After warming up, increase the engine speed to 3 000 r/min. with the engine tachometer reading, and read the oil pressure gauge.



09915-74510 : Oil pressure gauge
09915-77330 : Meter (for high pressure)

ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

The parts listed below can be removed and reinstalled without removing the engine from the frame. Refer to the page listed in each section for removal and reinstallation instructions.

ENGINE CENTER

	See page
Exhaust pipe/muffler	3-7
Oil filter	3-16
Oil pan	3-16
Sump filter	3-16
Carburetors	3-5
Throttle cable	3-5
Starter cable	3-5
Cam chain tensioner	3-10
Cylinder head cover (along with cylinder head breather cover)	3-10
Camshafts	3-11
Cylinder head	3-11
Cylinder	3-11
Pistons	3-12
Starter motor	3-15

ENGINE LEFT SIDE

	See page
Gearshift lever	3-6
Engine sprocket cover	3-6
Engine sprocket and drive chain	3-7
Neutral indicator switch body	3-14
Generator cover	3-14
Generator rotor	3-15
Starter idle gear	3-15
Starter clutch	3-41

ENGINE RIGHT SIDE

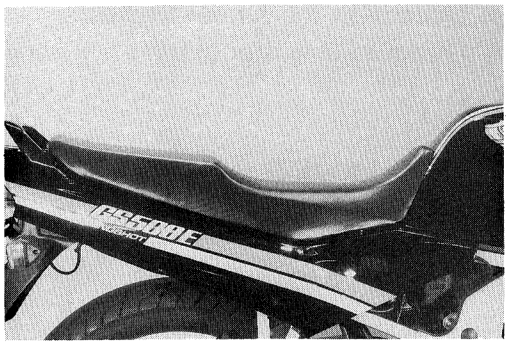
	See page
Signal generator cover	3-12
Signal generator	3-12
Oil pressure switch	3-53
Clutch cover	3-12
Clutch pressure, drive and driven plates	3-13
Clutch sleeve hub	3-13
Oil pump driven gear and oil pump	3-13
Primary driven gear and drive gear	3-13
Gearshift shaft	3-14

ENGINE REMOVAL AND REINSTALLATION

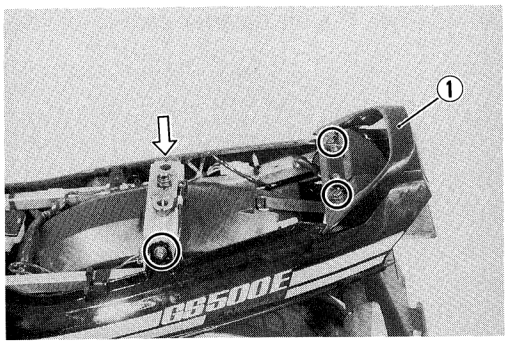
ENGINE REMOVAL

Before taking the engine out of the frame, wash the engine with a steam cleaner. The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.

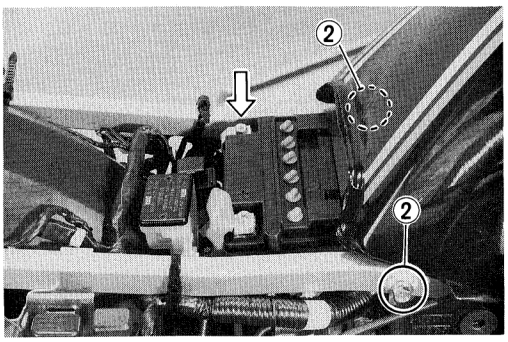
- Remove the seat.



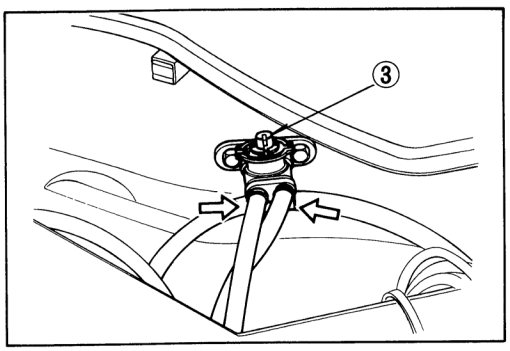
- Remove the pillion rider grabber ① by removing the bolts.
- Remove the left and right frame covers by removing the bolts.



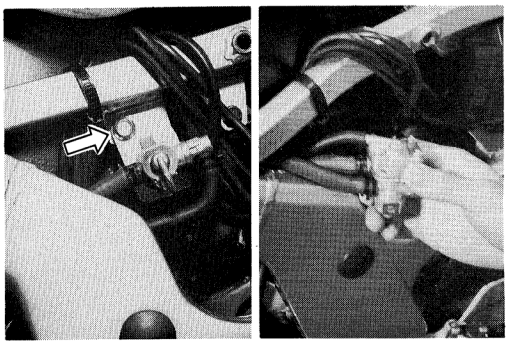
- Disconnect the battery ⊖ lead wire from the battery terminal.
- Remove the fuel tank mounting bolts ②, left and right.



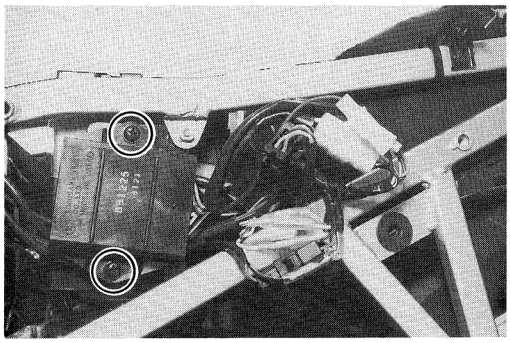
- Lift up the fuel tank and turn the fuel cock ③ to the OFF position.
- Disconnect the fuel hoses from the fuel cock and remove the fuel tank.



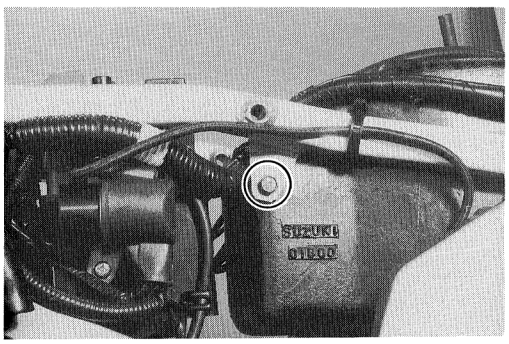
- Remove the fuel cock mounting bolt, and disconnect the fuel hoses and vacuum hose from the fuel cock.



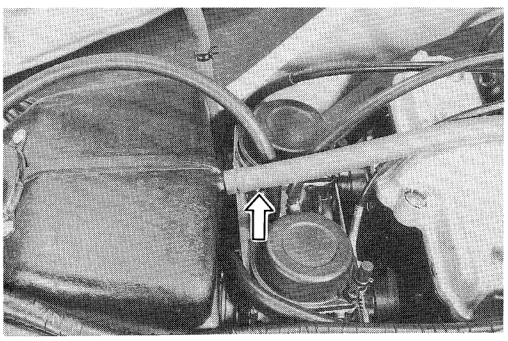
- Disconnect the various lead wires.
- Remove the ignitor unit by removing the screws.



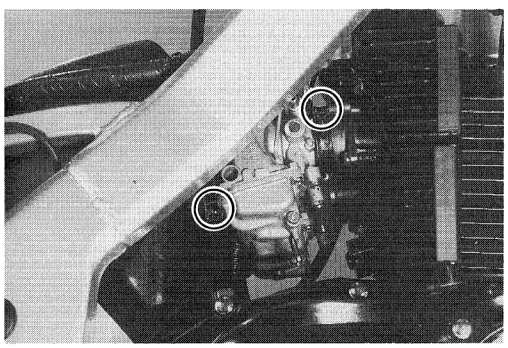
- Remove the air cleaner case mounting bolts, left and right.



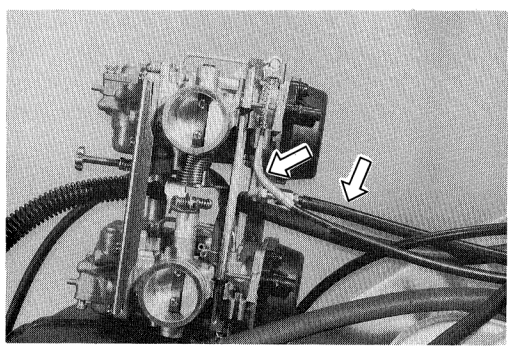
- Disconnect the breather hose from the air cleaner case.



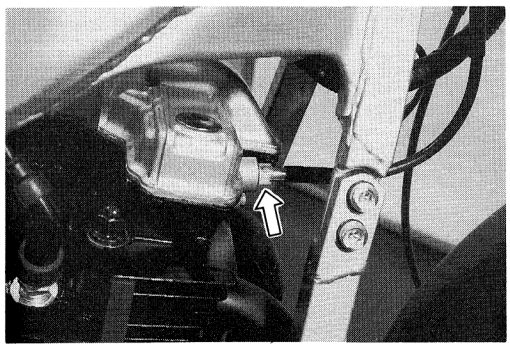
- Loosen the respective carburetor clamp screws and move the air cleaner case backward.



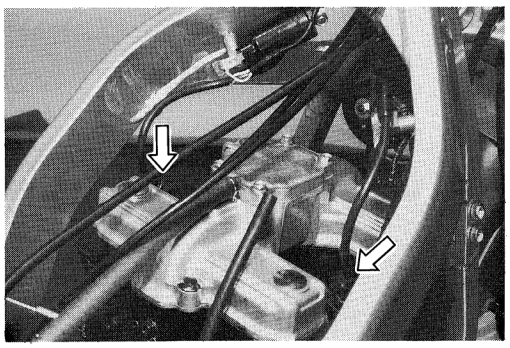
- Remove the carburetor assembly and disconnect the throttle cable and starter cable.



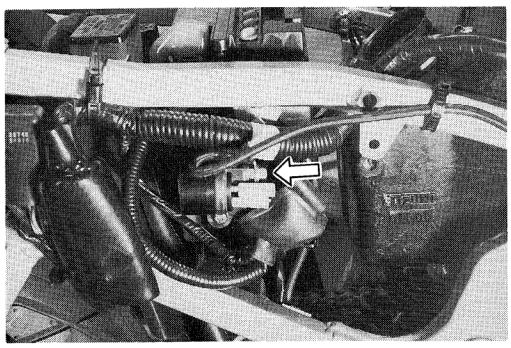
- Disconnect the tachometer cable from the cylinder head.



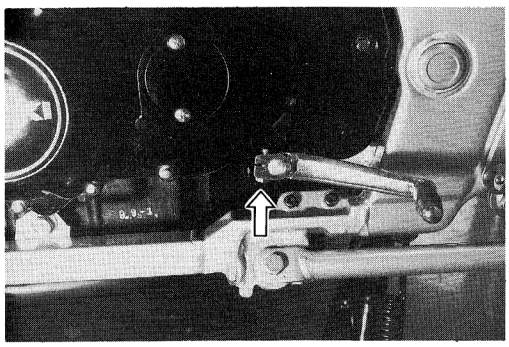
- Disconnect the spark plug caps.



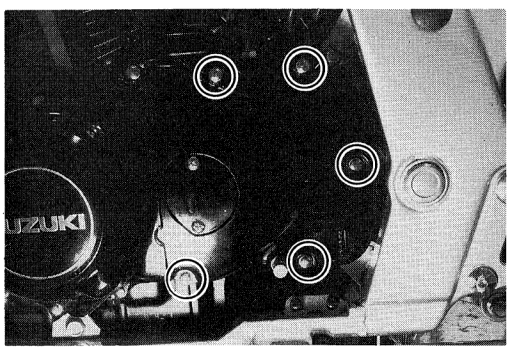
- Disconnect the starter motor lead wire from the starter relay.



- Remove the gearshift lever by removing the bolt.



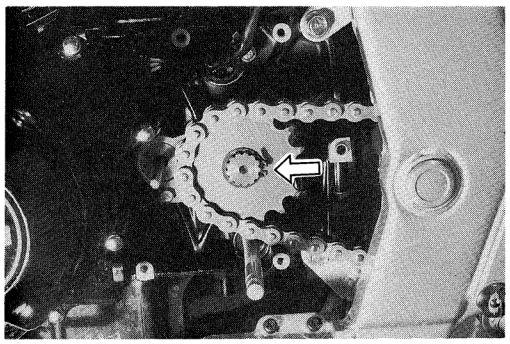
- Remove the engine sprocket cover by removing the bolts.



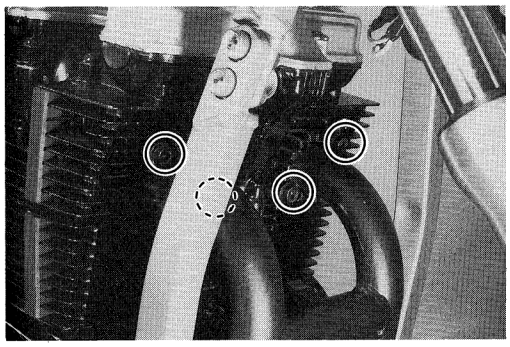
- Remove the engine sprocket by removing the circlip.

09900-06107 : Snap ring pliers

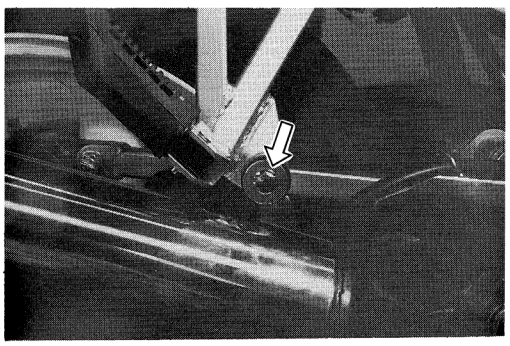
NOTE:
If it is difficult to remove the engine sprocket, loosen the axle nut and chain adjusting nuts to provide additional chain slack.



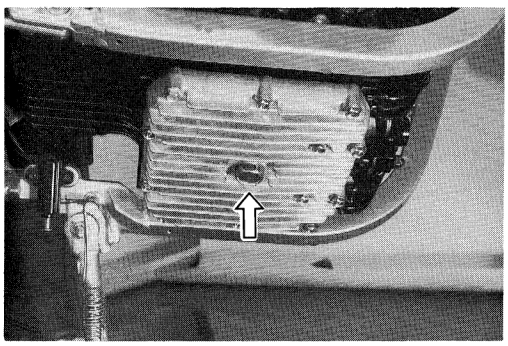
- Remove the four exhaust pipe clamp bolts.



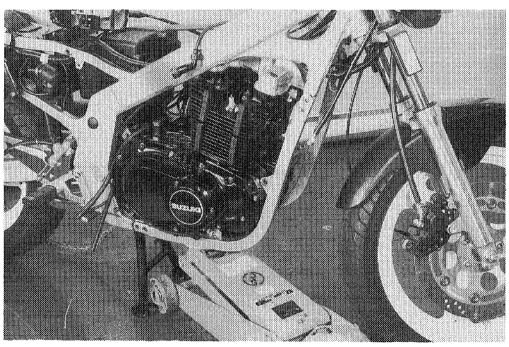
- Remove the muffler mounting bolt, then remove the exhaust pipe/muffler assembly.



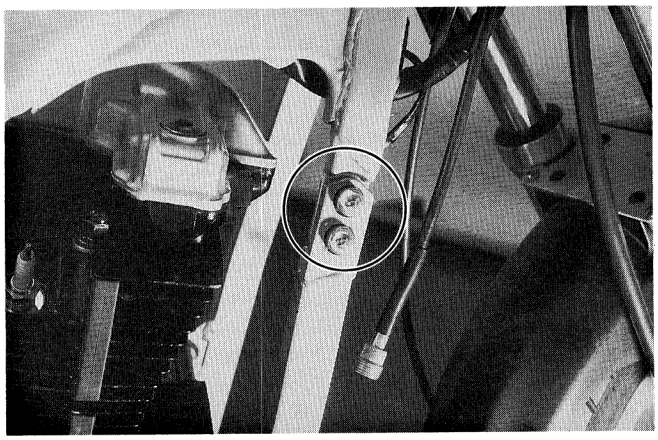
- Place an oil pan under the engine and remove the oil drain plug to drain out engine oil.

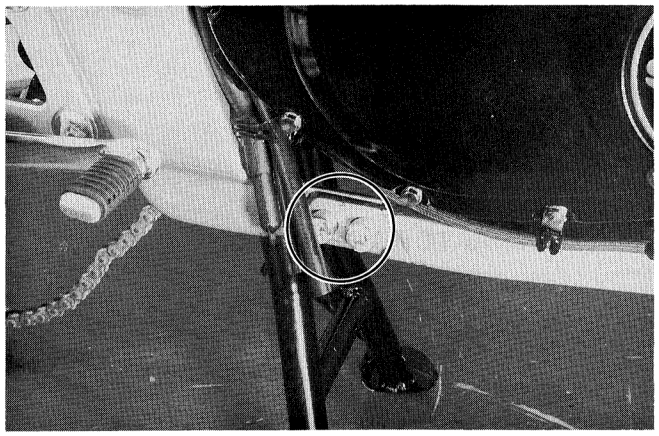


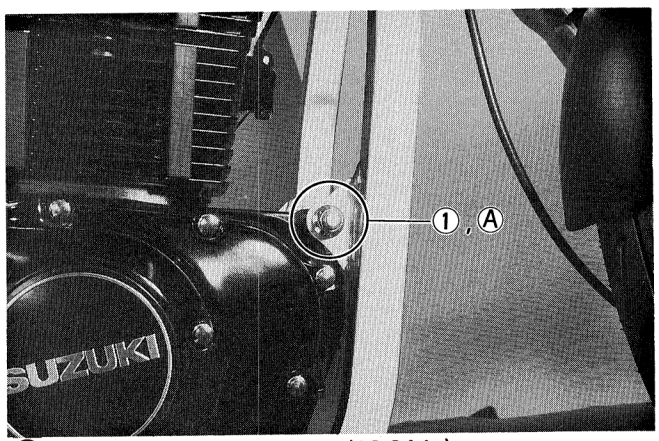
- Support the engine with a proper jack.



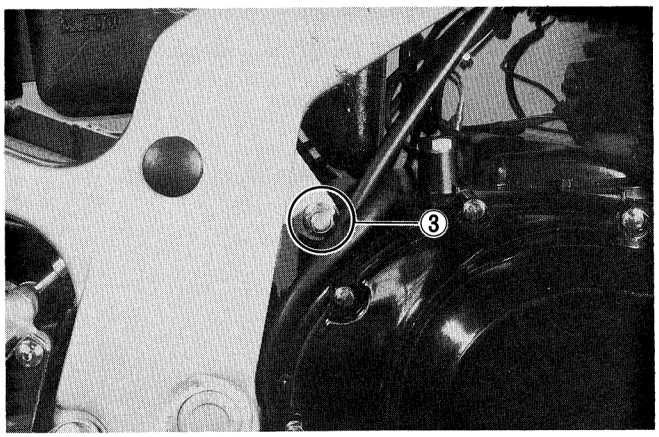
- Remove the right-side of frame down tube by removing the bolts and nuts, then remove the engine mounting bolts and nuts.
- Gradually lower the engine assembly.



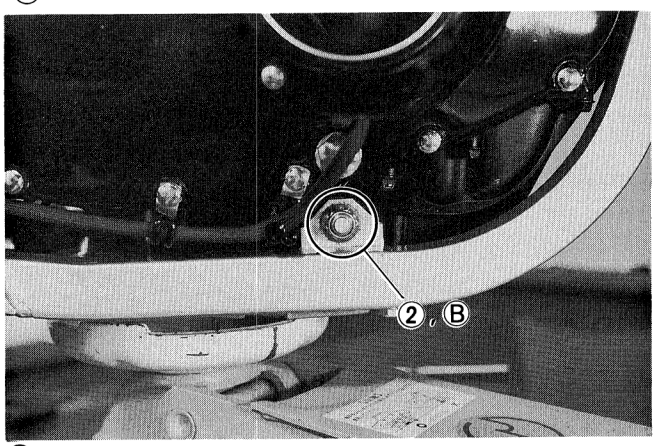




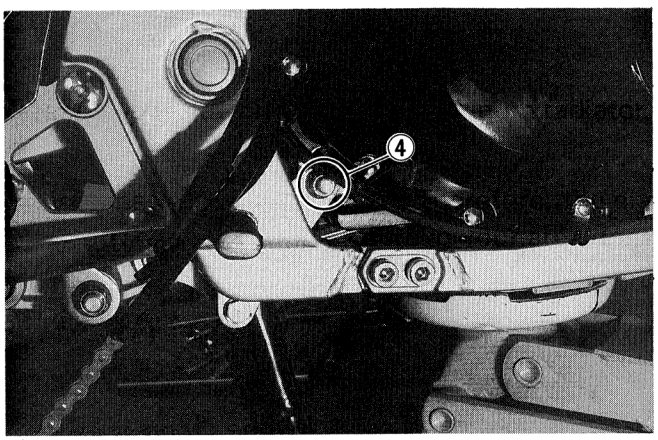
① BOLT LENGTH : 255 mm (10.04 in)
Ⓐ SPACER LENGTH : 65 mm (2.56 in) ... 2 pcs.



③ BOLT LENGTH : 170 mm (6.69 in)



② BOLT LENGTH : 240 mm (9.45 in)
Ⓑ SPACER LENGTH : 16.8 mm (0.66 in) ... 2 pcs.



④ BOLT LENGTH : 160 mm (6.30 in)

ENGINE REINSTALLATION

The engine can be installed in the reverse order of removal.

- Insert the two long bolts from left side. Install the bolts, spacers and nuts properly, as shown in the photographs on previous page.

NOTE:
The engine mounting nuts are self-locking. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.

TIGHTENING TORQUE

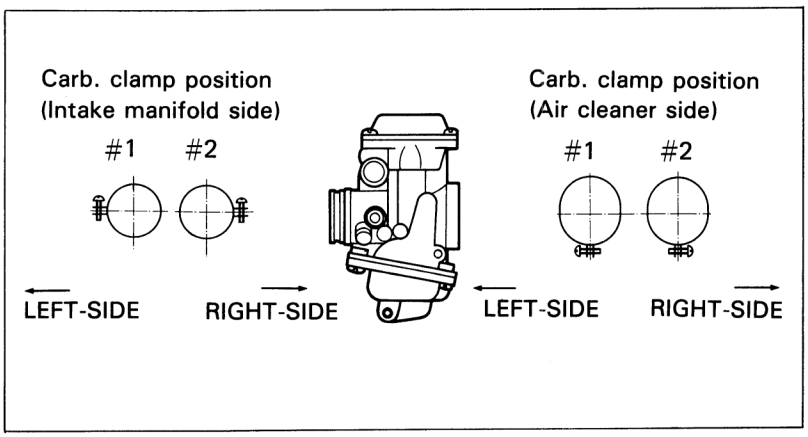
ITEM	N·m	kg-m	lb-ft
①, ② ③, ④	60 – 72	6.0 – 7.2	43.5 – 52.0

Frame down tube mounting bolts
. . . . . 25 – 38 N·m
(2.5 – 3.8 kg-m, 18.0 – 27.5 lb-ft)

LENGTH

Bolt ①	255 mm (10.04 in)
Bolt ②	240 mm (9.45 in)
Bolt ③	170 mm (6.69 in)
Bolt ④	160 mm (6.30 in)
Spacer Ⓐ	65 mm (2.56 in) 2 pcs.
Spacer Ⓑ	16.8 mm (0.66 in) 2 pcs.

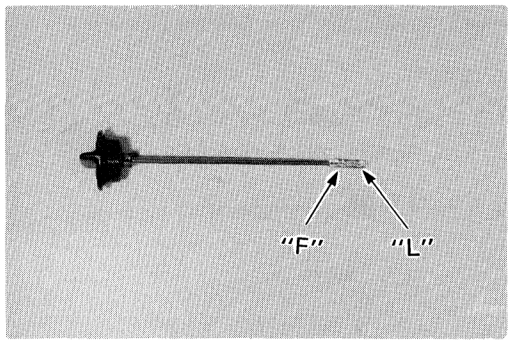
- Locate the carburator clamps, as shown in the illustration.



- Tighten the rear axle nut, exhaust pipe bolts and muffler mounting bolt to the specified torque. (See page 7-27.)
- After remounting the engine, route wiring harness, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (See pages 7-10 through 23.)
- Adjust the following items to the specification.

Page
* Throttle cable 2-11
* Drive chain 2-12
* Idling adjustment 2-11
* Balancing carburetors 4-12

- Pour 3.2L of engine oil SAE 10W/40 under API classification SE or SF into the engine.
  Several minutes after starting and stopping engine, check that the oil level remains between the marks (F and L) of oil level gauge.

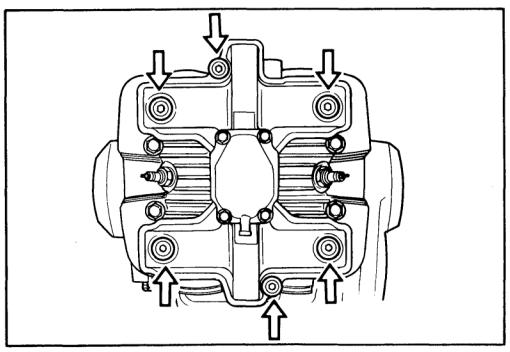


OIL CHANGE: 2 600 ml (2.7/2.3 US/Imp qt)
OIL AND FILTER CHANGE: 2 900 ml (3.1/2.6 US/Imp qt)
OVERHAUL: 3 200 ml (3.4/2.8 US/Imp qt)

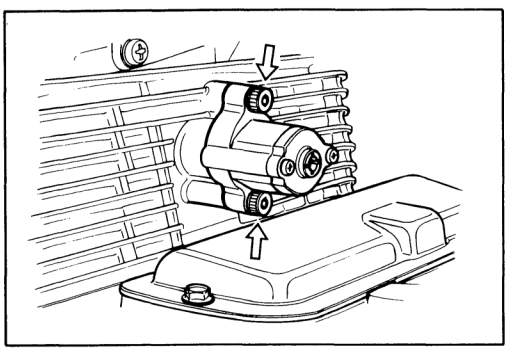
ENGINE DISASSEMBLY

- Remove the cylinder head cover.

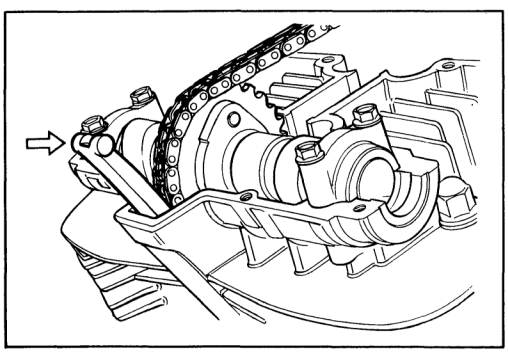
NOTE:
When removing the cylinder head cover, do not remove the breather cover.



- Remove the cam chain tensioner.



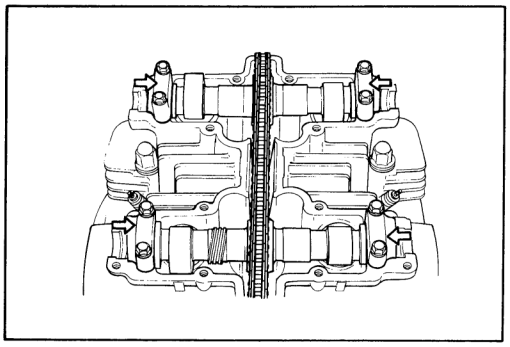
- Pull out the cam chain guide.



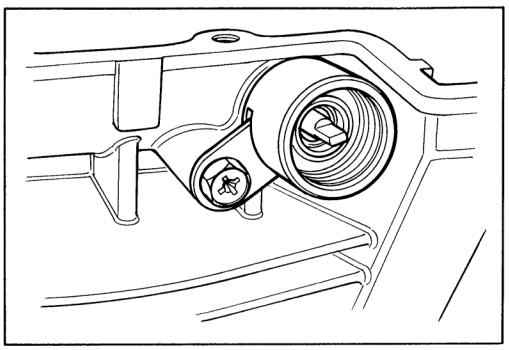
- Remove the four camshaft journal holders.

NOTE:
Be sure to loosen camshaft journal holder bolts evenly by shifting the wrench diagonally.

- Remove two camshafts; intake and exhaust.



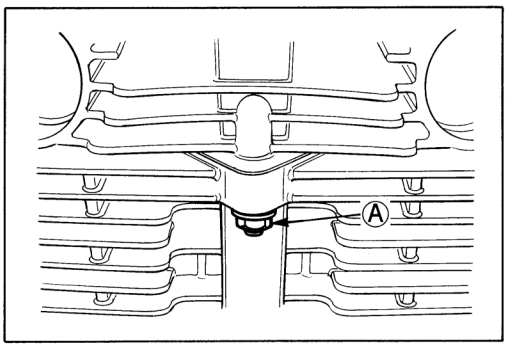
- Remove the tachometer driven gear along with its sleeve.



- The cylinder head becomes free for removal when its one 6-mm nut Ⓐ and eight 10-mm nuts are removed.

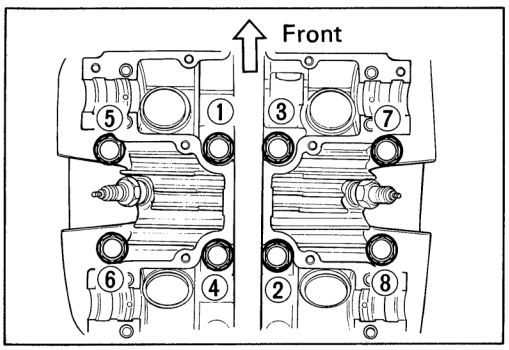
09911-74510 : Long socket 14 mm
09914-24510 : T-handle

NOTE:
When loosening the cylinder head nuts, loosen each nut little by little in a descending order according to the numbers cast on a cylinder head.



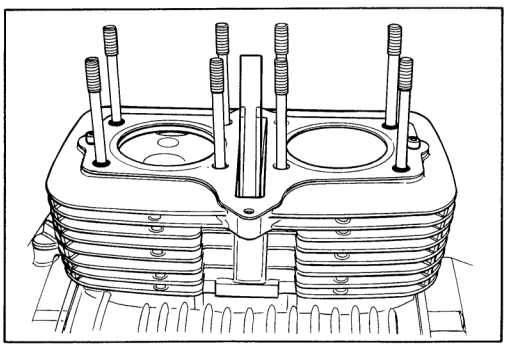
- Lift the cylinder head up to grip its both ends. If it does not come off, lightly tap on the finless portions of it with a plastic mallet.

CAUTION:
Be careful not to damage the fins when removing or handling the cylinder head.



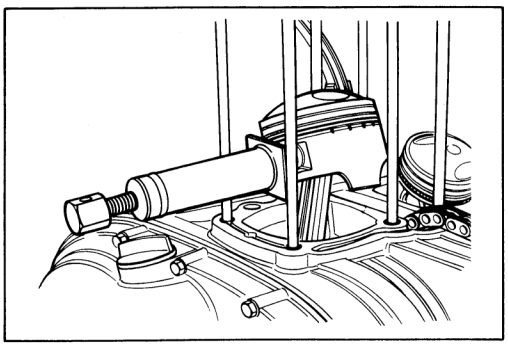
- Firmly grip both ends of the cylinder block and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to make the gasketed joint loose.

CAUTION:
Be careful not to damage the fins when removing or handling the cylinder block.

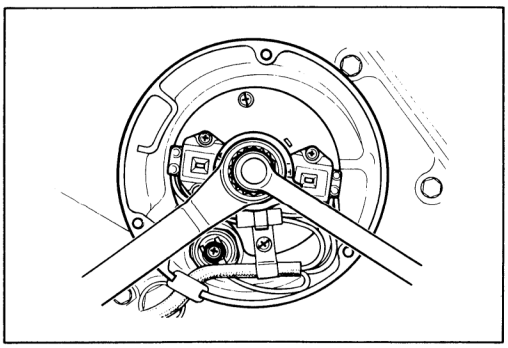


- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip with long-nose pliers.
- Draw out the piston pin with the special tool. Place each piston pin in the same piston as that it was removed from.

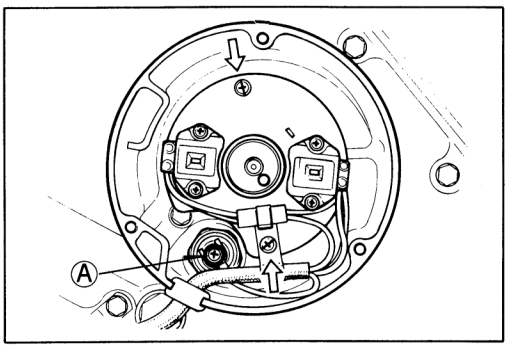
09910-34510 : Piston pin puller



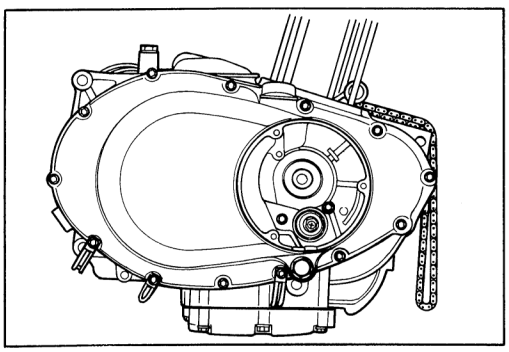
- Remove the signal generator cover.
- Remove the signal generator rotor.



- Disconnect the oil pressure switch lead wire Ⓐ.
- Remove the signal generator stator.



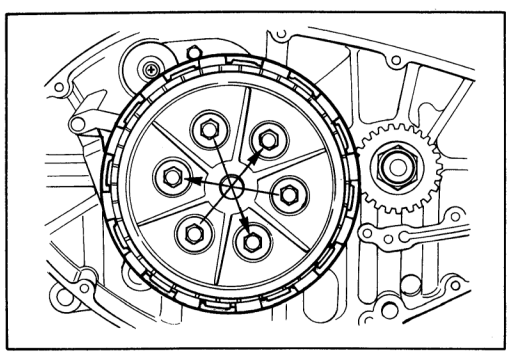
- Remove the clutch cover and its gasket.



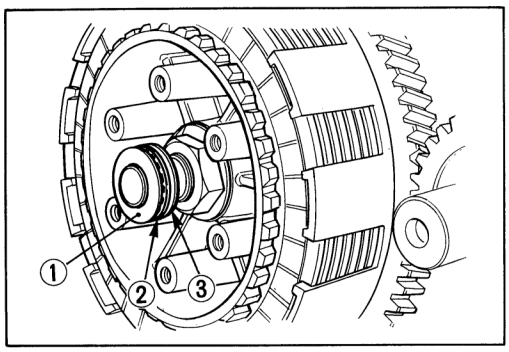
- Holding the conrod with a conrod stopper, remove the clutch spring set bolts diagonally.

09910-20116 : Conrod stopper

- Remove the clutch pressure plate.

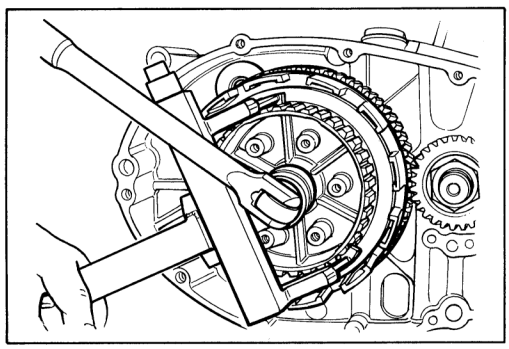


- Remove the thrust washer ①, bearing ② and clutch push piece ③, and then draw out the clutch push rod.



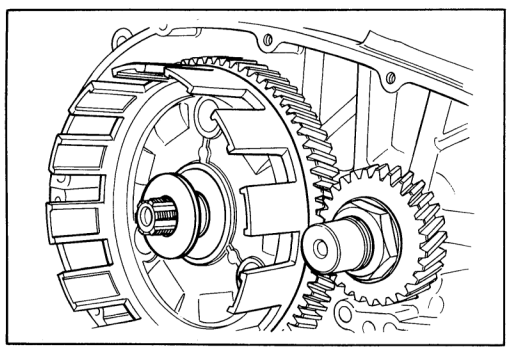
- After removal of clutch drive and driven plates, flatten the lock washer and remove the clutch sleeve hub nut by using the special tool.

09920-53710 : Clutch sleeve hub holder



- Remove the thrust washer and primary driven gear assembly.

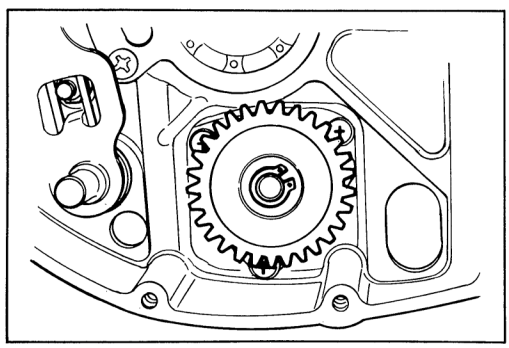
NOTE:
Bear in mind that the thrust washer is located behind the primary driven gear assembly.



- Remove the oil pump driven gear to remove circlip.

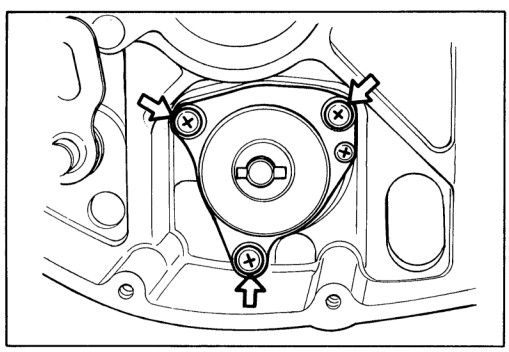
09900-06107 : Snap ring pliers

NOTE:
Do not lose the circlip, pin and washer.

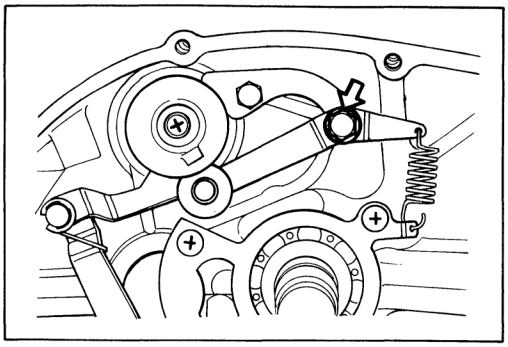


- Remove the oil pump.

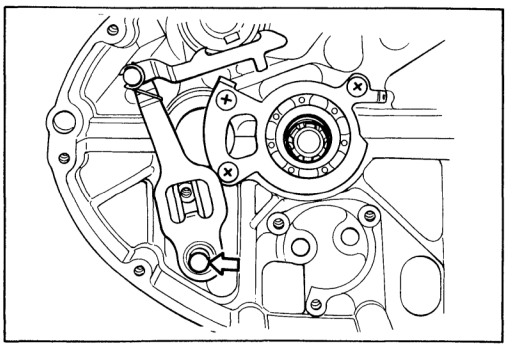
NOTE:
Do not lose the oil pump O-rings.



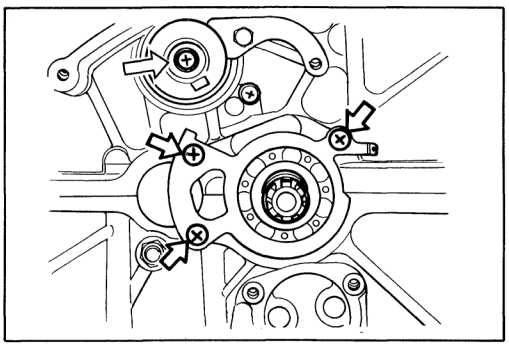
- Remove the gearshift cam stopper.



- Draw out the gearshift shaft assembly.



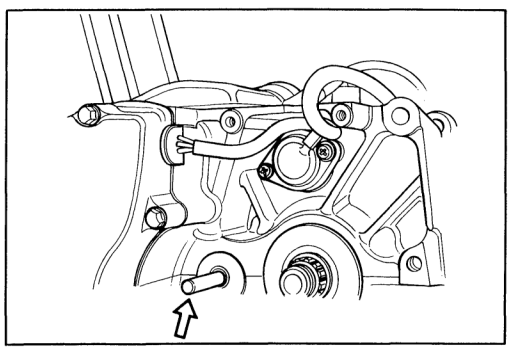
- Remove the bearing retainer.
- Remove the gearshift cam pin retainer.



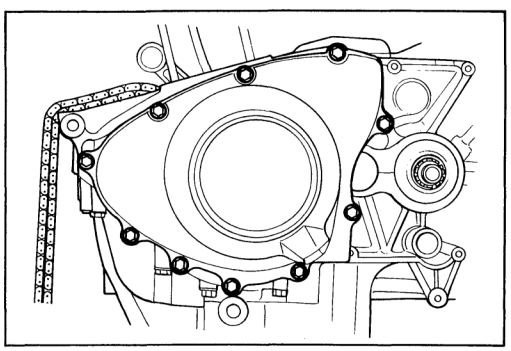
- Remove the neutral position indicator switch.

NOTE:
Do not lose the O-ring, switch contact and its spring.

- Remove the clutch push rod.

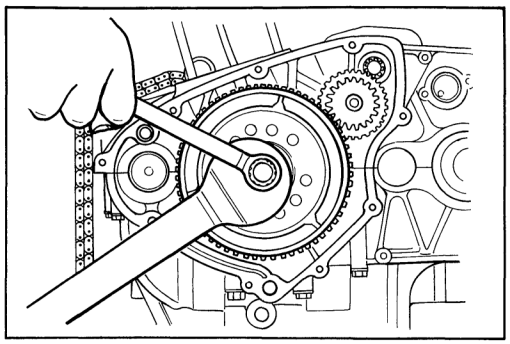


- Remove the generator cover and its gasket.



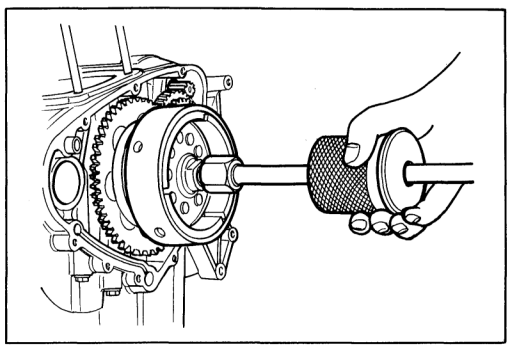
- Remove the generator rotor mounting bolt with the special tool.

09930-44511 : Generator rotor holder

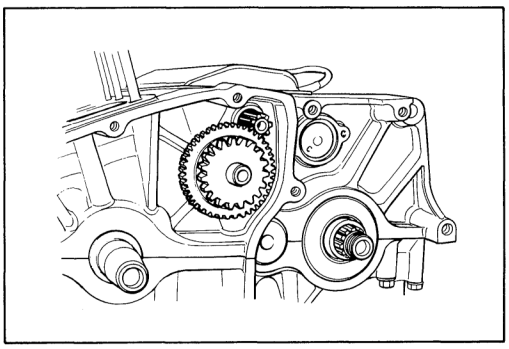


- Remove the generator rotor assembly from the crankshaft with the special tools.

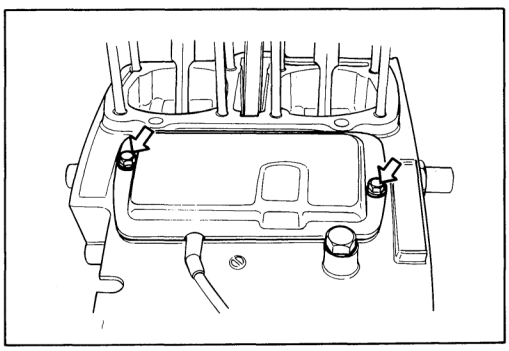
09930-30102 : Sliding shaft
09930-33710 : Rotor remover attachment



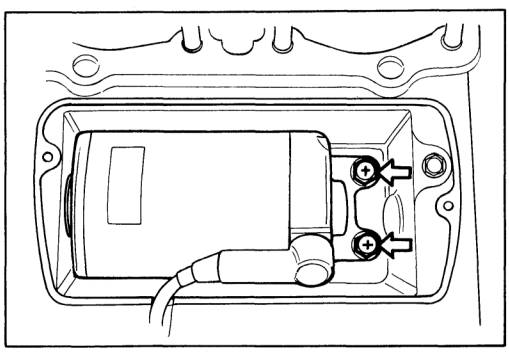
- Remove the starter idle gear and its shaft.



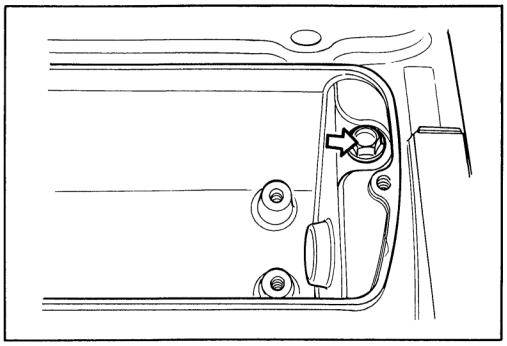
- Remove the starter motor cover.



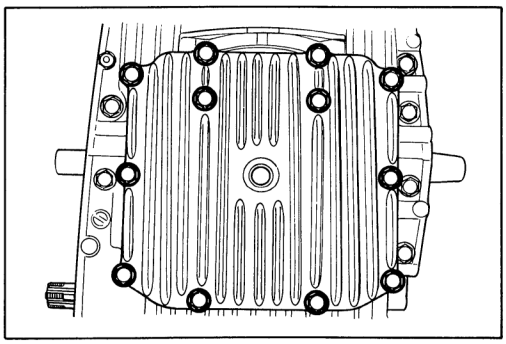
- Remove the starter motor.



- Remove the upper crankcase tightening bolt.

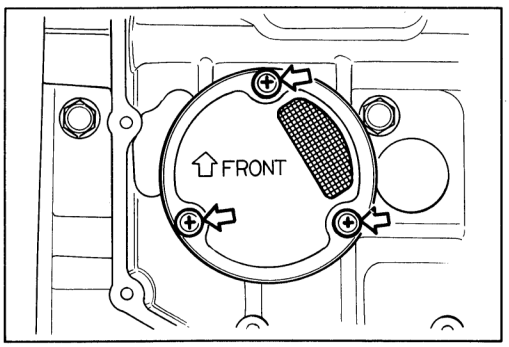


- Remove the oil pan.



- Remove the oil sump filter.

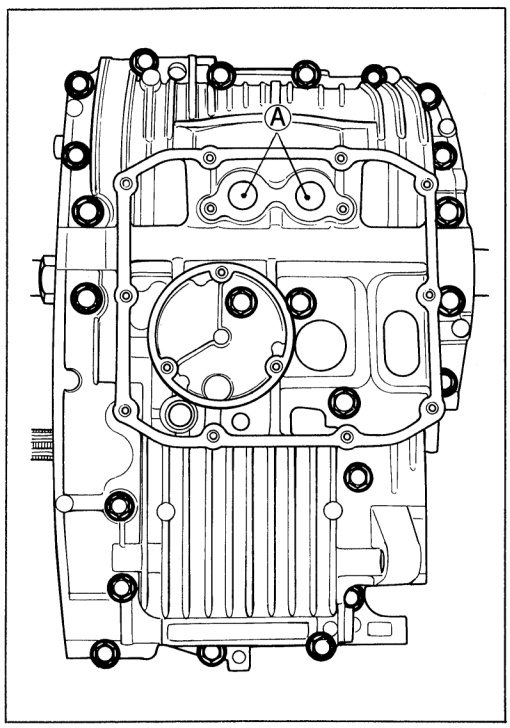
NOTE:
When installing the oil sump filter, face the arrow mark to the front.

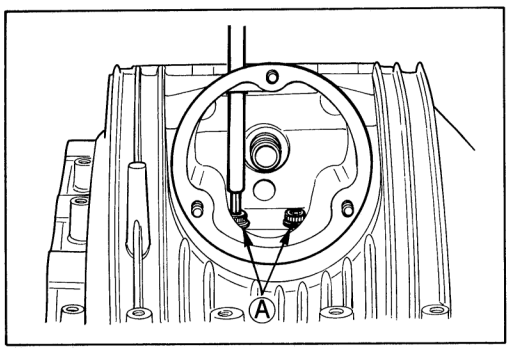


- Remove the oil filter cap and oil filter.
- Remove the crankcase/crankshaft tightening bolts.

NOTE:
* *When loosening the crankcase/crankshaft tightening bolts, loosen them from outside to inside.*
* *Two allen bolts are used for tightening crankshaft at the portion Ⓐ.*
* *Make sure that all bolts are removed before using the crankcase separating tool.*

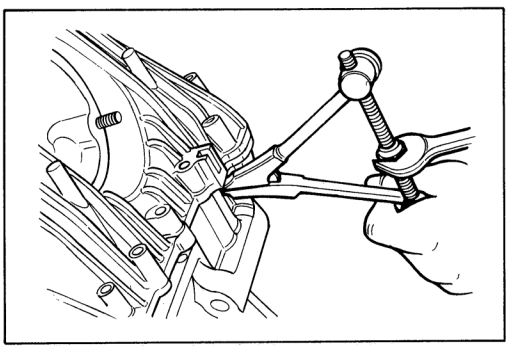
09914-25811 : 6 mm "T" type hexagon wrench





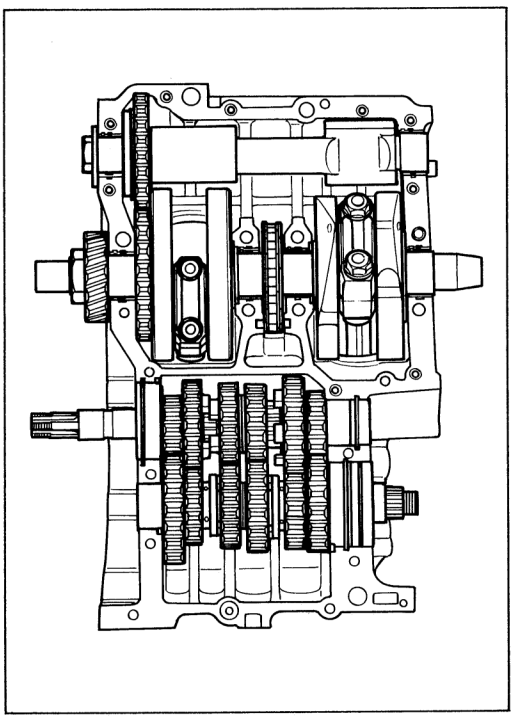
- Separate the upper and lower crankcase halves with the special tool.

09912-34510 : Crankcase separating tool



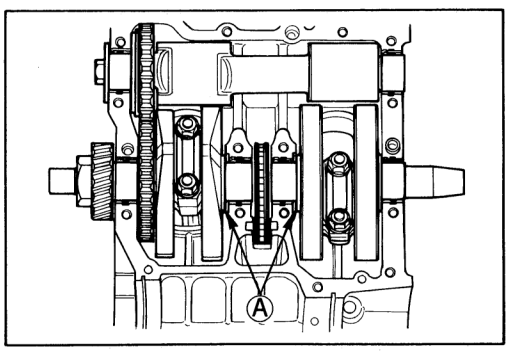
- Remove the countershaft assembly and driveshaft assembly.

NOTE:
Do not lose the C-rings.

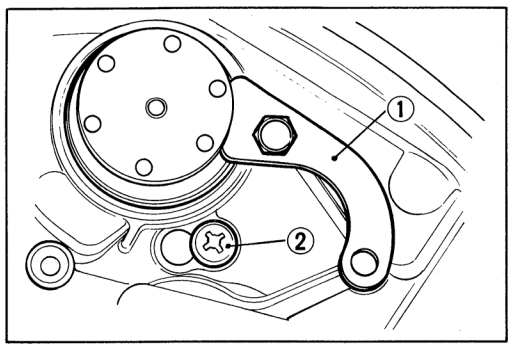


- Remove the crankshaft assembly and counter-balancer shaft assembly.

NOTE:
Bear in mind that the crankshaft thrust bearings Ⓐ are located between shaft and case.

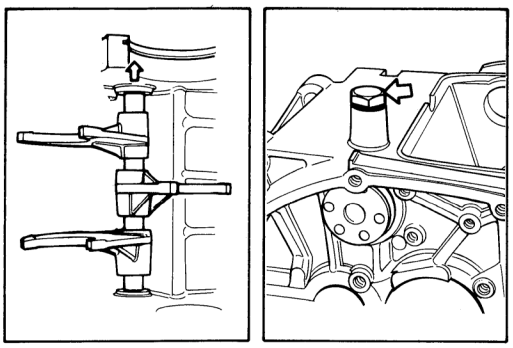


- Remove the gearshift cam guide ① and gearshift fork shaft stopper screw ②.



- Holding the gearshift forks by hand, draw out the gearshift fork shaft from the upper crankcase.
- Remove the neutral positioning stopper, and then remove the gearshift cam.

NOTE:
Do not lose the neutral positioning spring.



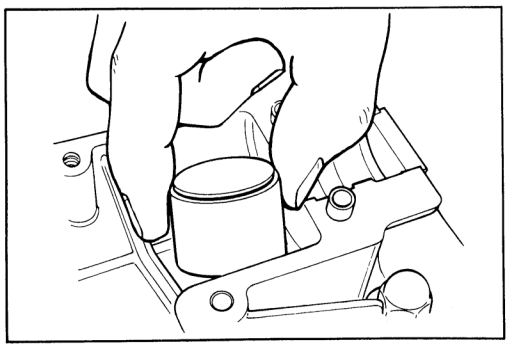
ENGINE COMPONENTS INSPECTION AND SERVICE

CYLINDER HEAD

CYLINDER HEAD SERVICE

CAUTION:
Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No. 1", "No. 2", "Exhaust", "Inlet", so that each will be restored to the original location during assembly.

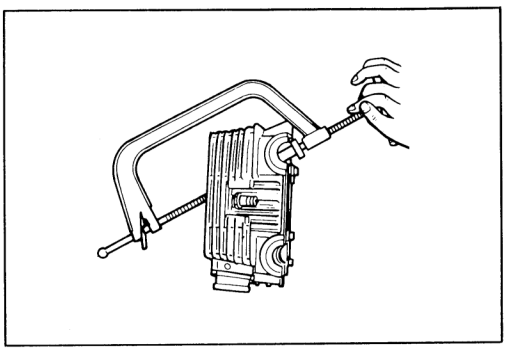
NOTE:
If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.

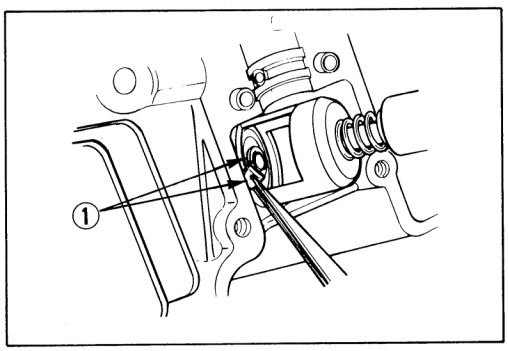


- Pull out the tappets and shims with fingers.

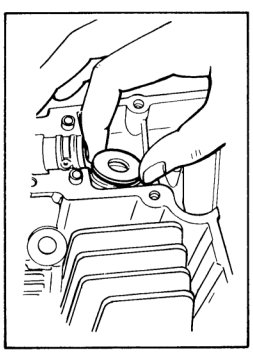
- Using special tools, compress the valve springs and take off the two cotter halves ① from valve stem.

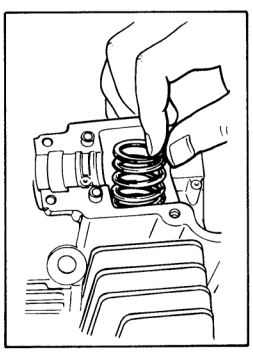
09916-14510 : Valve lifter
09916-84510 : Tweezers



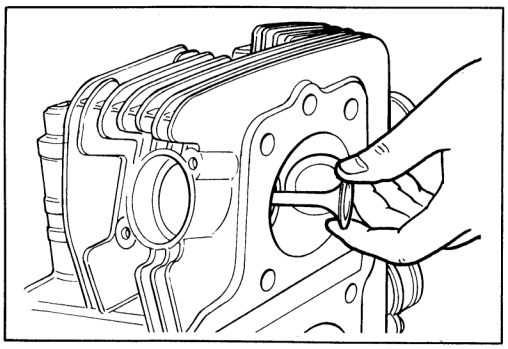


- Take out the spring retainer, inner and outer springs.





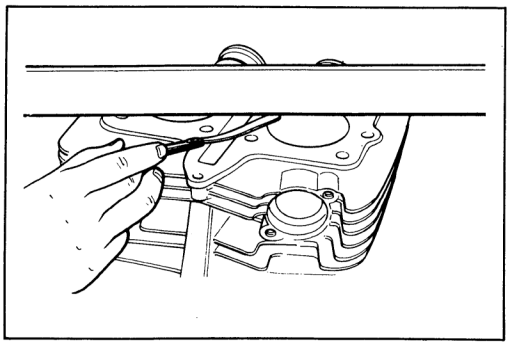
- Pull out the valves from the other side.



CYLINDER HEAD DISTORTION

Remove the carbon deposits.
Check the gasket surface of the cylinder head for distortion with a straight edge and thickness gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straight edge exceeds the limit, replace the cylinder head.

09900-20803 : Thickness gauge



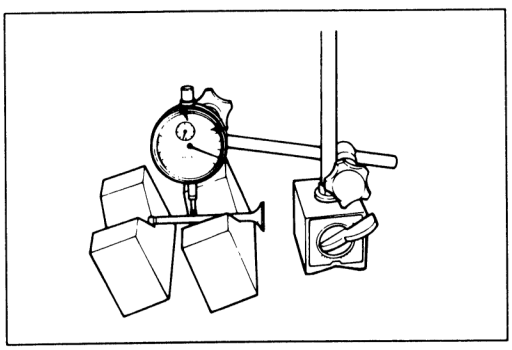
Cylinder head distortion	Service Limit
	0.1 mm (0.004 in)

VALVES

VALVE STEM RUNOUT

Support the valve with "V" blocks, as shown, and check its runout with a dial gauge.
The valve must be replaced if the runout exceeds the limit.

09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand
09900-21304 : V-block (100 mm) } **Not available in U.S.A.**

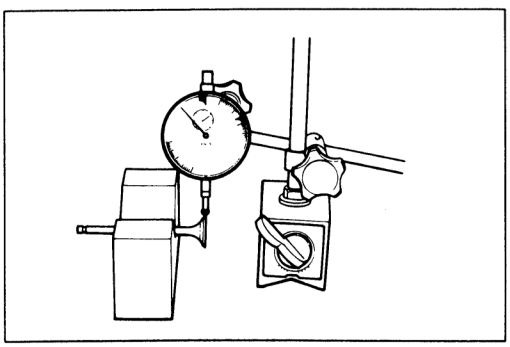


Valve stem runout	Service Limit
IN & EX	0.05 mm (0.002 in)

VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head face, and measure the valve head radial runout.
If it measures more than the limit, replace the valve.

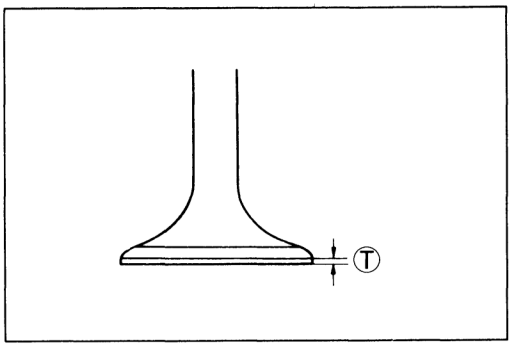
09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand
09900-21304 : V-block (100 mm) } **Not available in U.S.A.**



Valve head radial runout	Service Limit
	0.03 mm (0.001 in)

VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.
The thickness Ⓣ decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have been reduced to the limit, replace it.

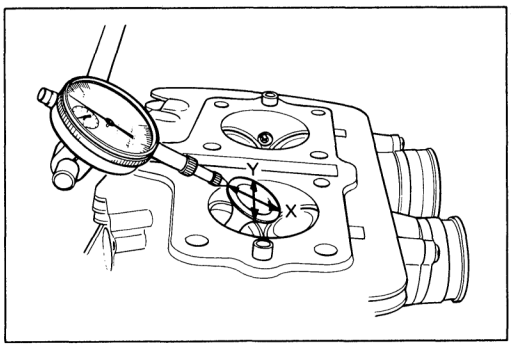


09900-20102 : Vernier calipers

Valve head thickness	Service Limit
	0.5 mm (0.02 in)

VALVE GUIDE-VALVE STEM CLEARANCE

Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown. If the clearance measured exceeds the limit, determine whether the valve or the guide should be replaced to reduce the clearance to the standard range:

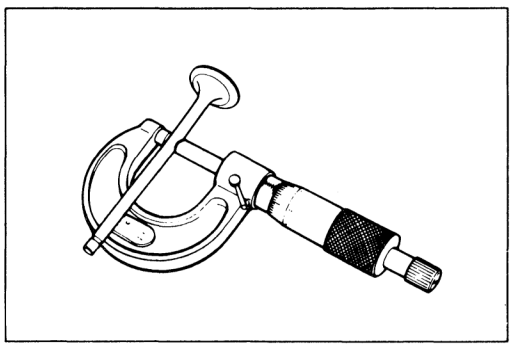


09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand (Not available in U.S.A.)

Valve guide to valve stem clearance	Service Limit
IN & EX	0.35 mm (0.014 in)

VALVE STEM WEAR

If the valve stem is worn down to the limit to measure with a micrometer, where the clearance is found to be in excess of the limit indicated, replace the valve. If the stem is within the limit, replace the guide. After replacing valve or guide, be sure to recheck the clearance.

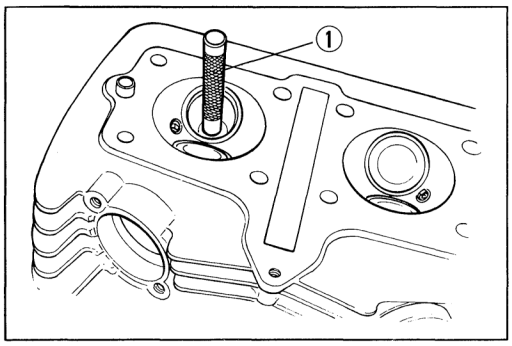


09900-20205 : Micrometer (1/1000 mm, 0-25 mm)

Valve stem outer diameter	Standard
IN	6.960 – 6.975 mm (0.2740 – 0.2746 in)
EX	6.945 – 6.960 mm (0.2734 – 0.2740 in)

VALVE GUIDE SERVICE

- Using the valve guide remover ①, drive the valve guide out toward intake or exhaust camshaft side.



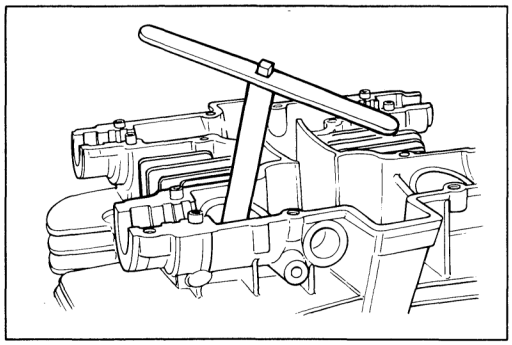
09916-44511 : Valve guide remover

NOTE:

* *Discard the removed valve guide subassemblies.*
* *Only oversized valve guides are available as the replacement parts.*

- Re-finish the valve guide holes in cylinder head with the reamer and handle.

09916-34531 : Valve guide reamer (12.3 mm)
09916-34541 : Reamer handle



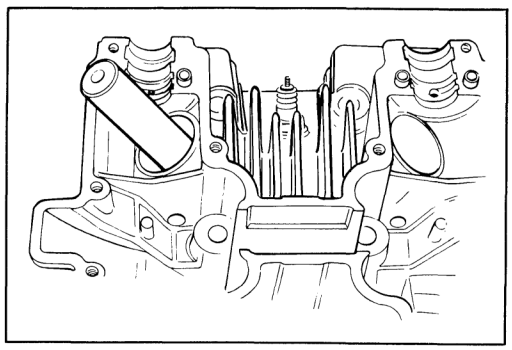
- Fit a ring to each valve guide.

NOTE:
Be sure to use new rings and valve guides.

Valve guide oversize : 0.3 mm (11115-45740)

- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide installer.

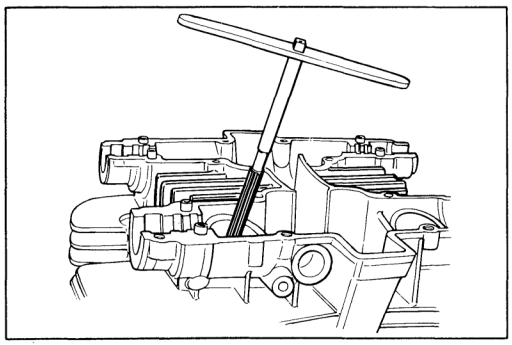
09916-57321 : Valve guide installer handle
09916-54531 : Attachment



CAUTION:
Failure to oil the valve guide hole before driving the new guide into place may result in a damaged guide or head.

- After fitting the valve guides, re-finish their guiding bores with the reamer.

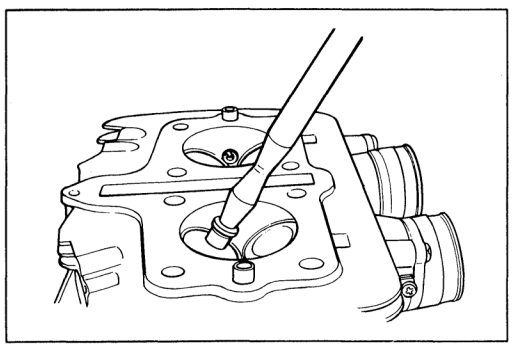
09916-34520 : Valve guide reamer (7 mm)
09916-34541 : Reamer handle



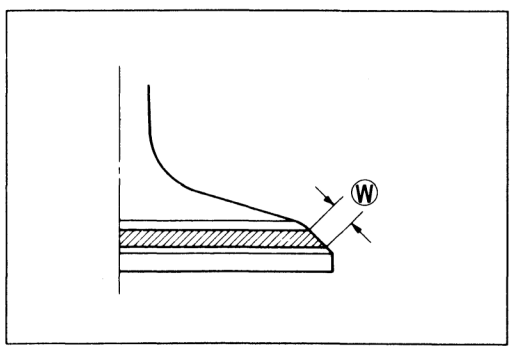
NOTE:
Be sure to clean and oil the guides after reaming.

VALVE SEAT WIDTH

- Coat the valve seat with Prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.
- The ring-like dye impression left on the valve face must be continuous-without any break. In addition, the width of the dye ring, which is the visualized seat "width Ⓦ", must be within the following specification:

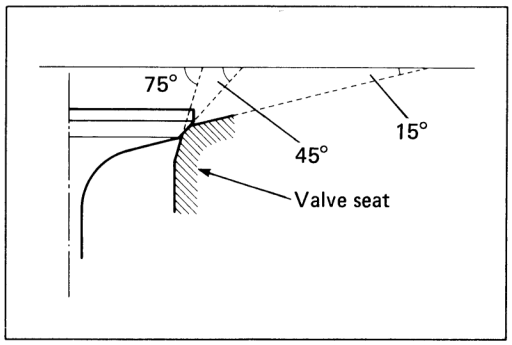


Valve seat width	Standard
IN & EX	1.0 – 1.2 mm (0.04 – 0.05 in)



If either requirement is not met, correct the seat by servicing it as follows:

VALVE SEAT SERVICE



The valve seats for both intake and exhaust valves are machined to two different angles. The seat contact surface is cut 45° and the area above the contact surface (closest to the combustion chamber) is cut to 15°.

(For U.S.A. model)
Valve seat cutter : (N-635), (N-229) and (N-211)
Solid pilot : (N-140-7.0)

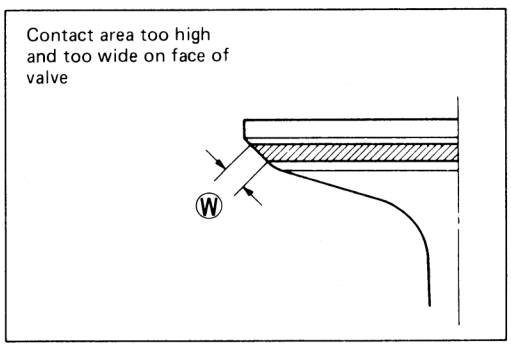
(For the Other models)
09916-24900 : Valve seat cutter set
(N-635) : Valve seat cutter
(N-229) : Valve seat cutter
(N-211) : Valve seat cutter
(N-140-7.0) : Solid pilot

	Intake side	Exhaust side
45°	N-635	N-229
15°	N-635	N-229
75°	N-211	N-211

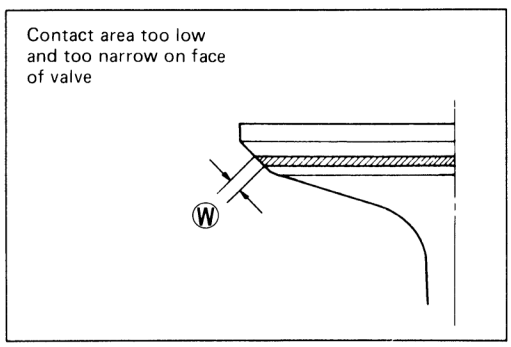
NOTE:
The valve seat contact area must be inspected after each cut.

- Insert the solid pilot with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T handle.
- Using the 45° cutter, descale and clean up the seat with one or two turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.

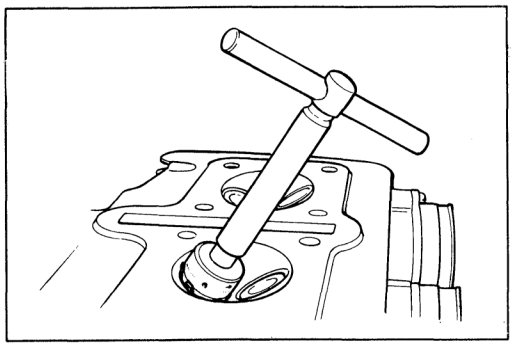


If the contact area is too high on the valve, or if it is too wide, use the 15°/75° cutter to lower and narrow the contact area.



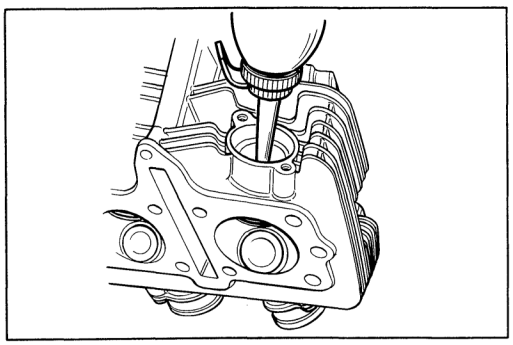
If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area.

- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.



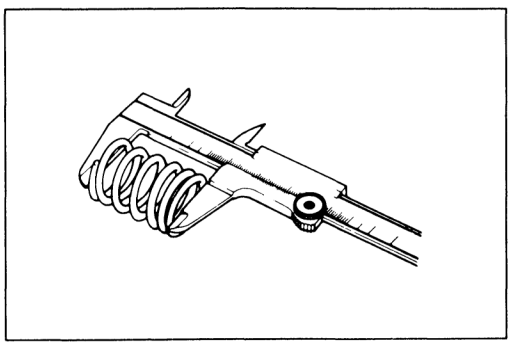
CAUTION:
DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.

- Clean and assemble the head and valve components.
- Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.



WARNING:
Always use extreme caution when handling gasoline.

NOTE:
After servicing the valve seats, be sure to adjust the tappet clearance after the cylinder head has been reinstalled. (See page 2-6.)



VALVE SPRINGS

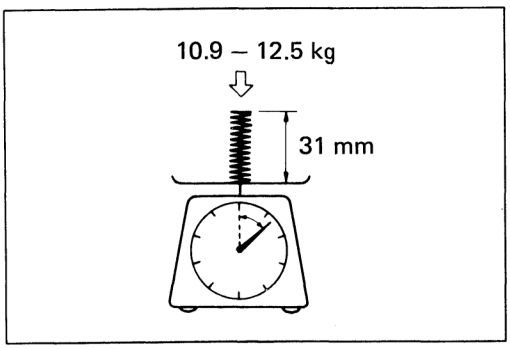
The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism. Check the valve springs for proper strength by measuring their free lengths and also by the force required to compress them. If the spring length is less than the service limit, or if the force required to compress the spring dose not fall within the range specified, replace both the inner and outer springs as a set.

09900-20102 : Vernier calipers (200 mm)

CAUTION:
Replace both the valve springs, inner and outer, at a time, if any one of these is found to be beyond the limit.

Valve spring free length	Service Limit
INNER	35.6 mm (1.40 in)
OUTER	40.6 mm (1.60 in)

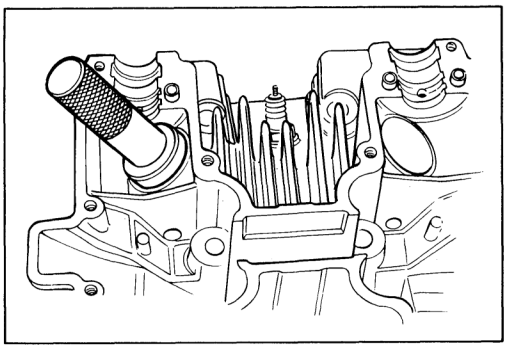
Valve spring tension	Standard
INNER	10.9 – 12.5 kg/31.0 mm (24.0 – 27.6 lbs/1.22 in)
OUTER	20.3 – 23.3 kg/35.0 mm (44.8 – 51.4 lbs/1.38 in)



REASSEMBLY

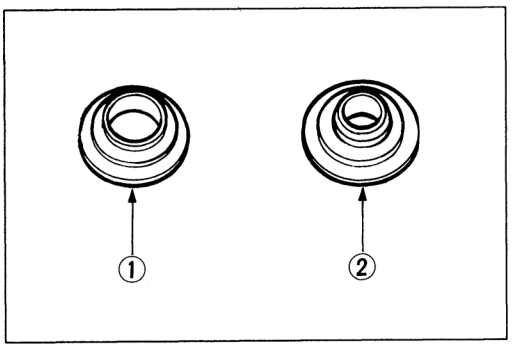
- Oil each oil seal and press-fit them into position with the valve stem seal installer.

09916-57321 : Valve guide installer handle
09911-94530 : Attachment.



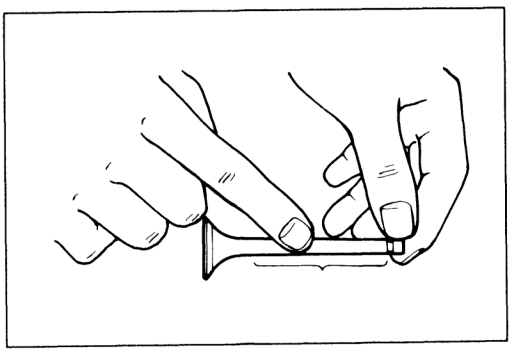
CAUTION:
Do not reuse the oil seals.

- Install the valve spring lower seat ①.



CAUTION:
Be careful not to confuse the lower seat with the spring retainer ②.

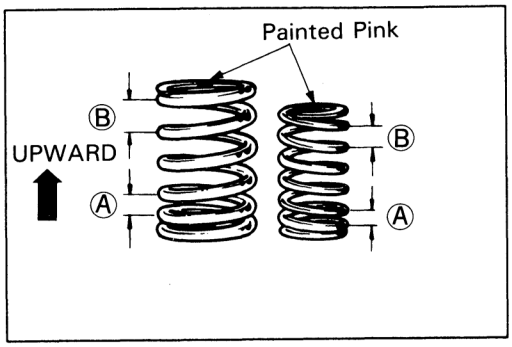
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.



CAUTION:
When inserting each valve, take care not to damage the lip of the stem seal.

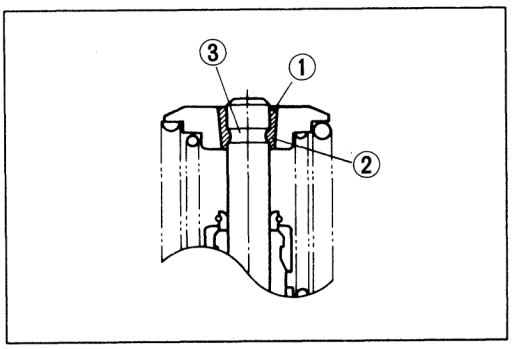
99000-25140 : SUZUKI MOLY PASTE

- Install the valve springs with the small-pitch portion Ⓐ facing cylinder head.
  Ⓑ : Large-pitch portion



- Put on the valve spring retainer and, using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter ① to wedge in between retainer and stem.

NOTE:
Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in the stem end.

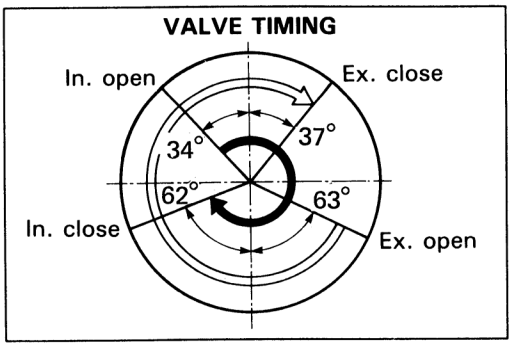


09916-14510 : Valve lifter
09916-84510 : Tweezers

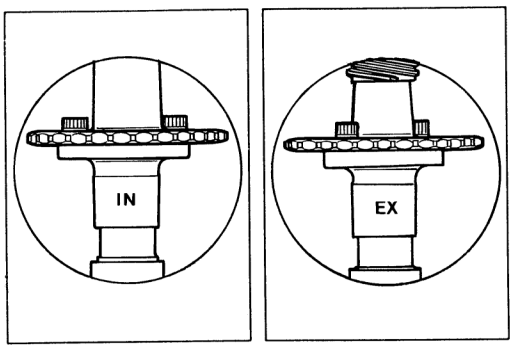
CAUTION:
Be sure to restore each spring and valve to their original positions.

CAMSHAFTS

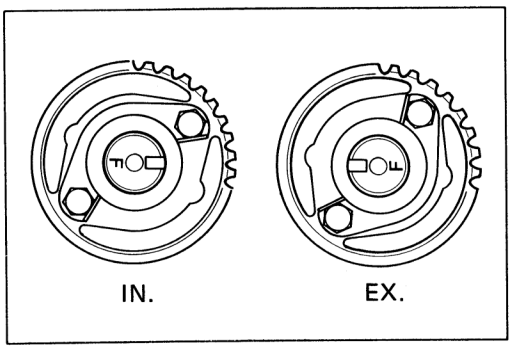
Both camshafts should be checked for runout and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.



The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake).



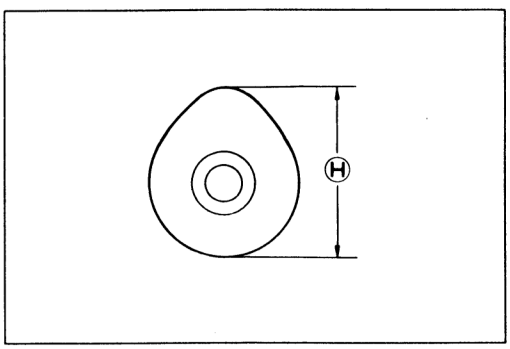
Similarly, the right end can be distinguished by the notch from the left end.
The punch letter "F" on the right end of both camshafts of this model means to distinguish these camshafts from those of other models.



CAM WEAR

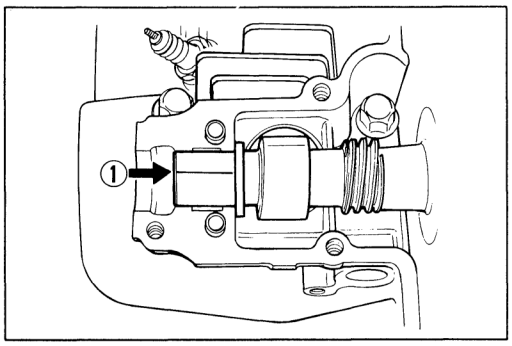
Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ, which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

09900-20202 : Micrometer (25 — 50 mm)



Cam height Ⓗ	Service Limit
IN	36.49 mm (1.437 in)
EX	36.00 mm (1.417 in)

CAMSHAFT JOURNAL WEAR



Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place.

- Use plastigauge ① to read the clearance at the widest portion, which is specified as follows:

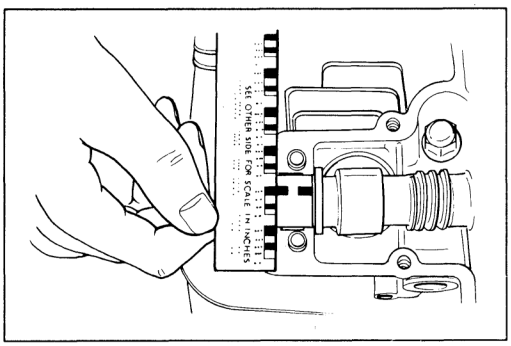
09900-22301 : Plastigauge
(Not available in U.S.A.)

Camshaft journal oil clearance	Service Limit
IN & EX	0.150 mm (0.0059 in)

NOTE:
Install each holder to their original positions.

- Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

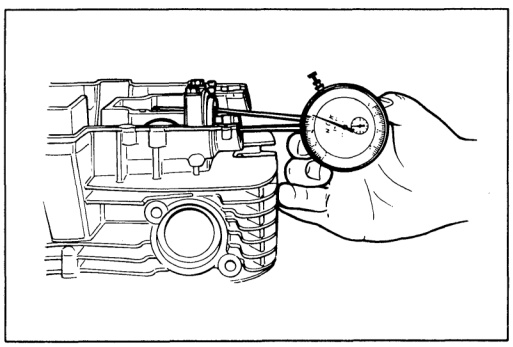
Camshaft journal holder bolt : 8 — 12 N·m
(0.8 — 1.2 kg-m,
6.0 — 8.5 lb-ft)



NOTE:
Do not rotate the camshaft with plastigauge is in place.

- Remove the camshaft holders, and read the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

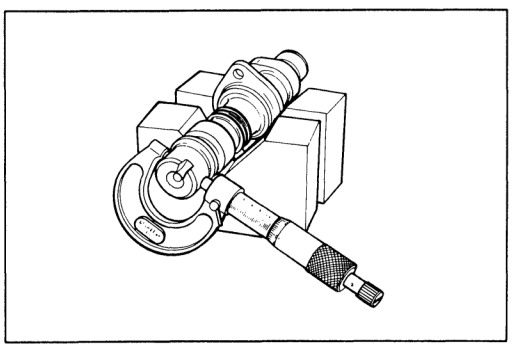
If the camshaft journal oil clearance measured exceeds the limit, measure the following two portions:



- Inner diameter of camshaft journal holder

09900-20602 : Dial gauge (1/1000 mm, 1 mm)
09900-22403 : Small bore gauge (18-35 mm)
(Not available in U.S.A.)

Camshaft journal holder I.D.	Standard
IN & EX	22.012 — 22.025 mm (0.8666 — 0.8671 in)



- Outer diameter of camshaft journal

09900-20205 : Micrometer (0-25 mm)

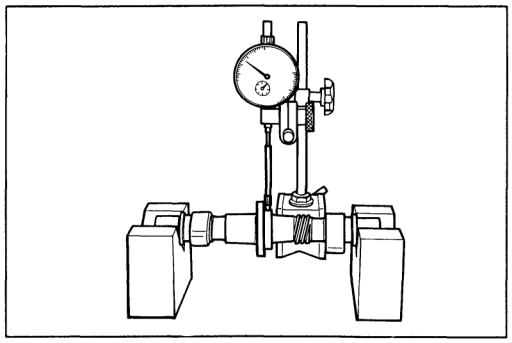
Camshaft journal O.D.	Standard
IN & EX	21.959 — 21.980 mm (0.8645 — 0.8654 in)

Replace the camshaft or cylinder head depending upon which one exceeds the specification.

CAMSHAFT RUNOUT

Measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the limit.

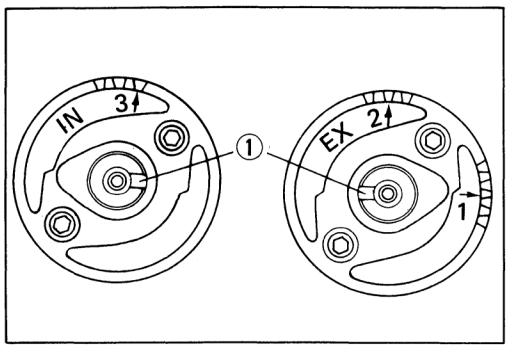
09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand
09900-21304 : V-block (100 mm) } **Not available in U.S.A.**



Camshaft runout	Service Limit
IN & EX	0.1 mm (0.004 in)

CAM SPROCKET

The fixed position of each cam sprocket on each camshaft is determined by arrow mark "3", on INTAKE sprocket, or arrow marks "1" and "2", on EXHAUST sprocket, located in reference to the notch ① in the right end of each camshaft.

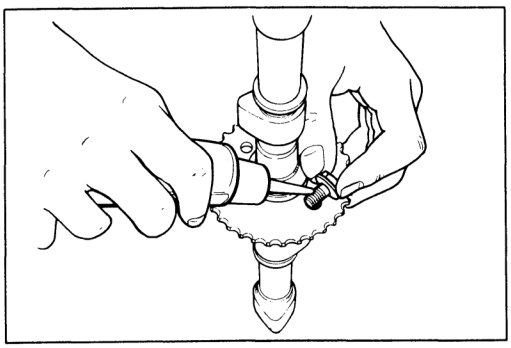


REASSEMBLY

- Apply THREAD LOCK SUPER "1303" to the threads of cam sprocket bolts, and tighten them to the specified torque.
- Bend up the washer tongue positively to lock the bolts.

99000-32030 : THREAD LOCK SUPER "1303"

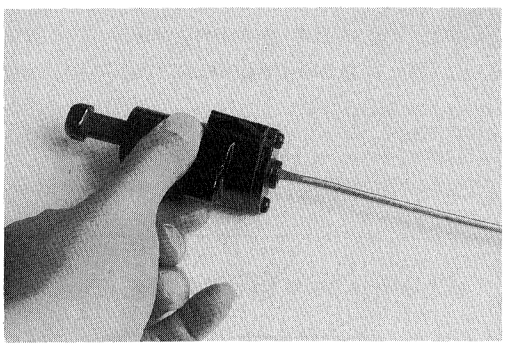
Cam sprocket bolt : 17 – 19 N·m
(1.7 – 1.9 kg-m, 12.5 – 13.5 lb-ft)



CAM CHAIN TENSIONER

The cam chain is maintained at the proper tension by an automatically adjusted tensioner.

Insert the ⊖ screwdriver into the slotted end of cam chain tensioner and turn the ⊖ screwdriver clockwise to lessen the tension and release the ⊖ screwdriver from the cam chain tensioner, to make sure the push rod movement. If the push rod is stuck or spring mechanism failed, replace the cam chain tensioner assembly with a new one.

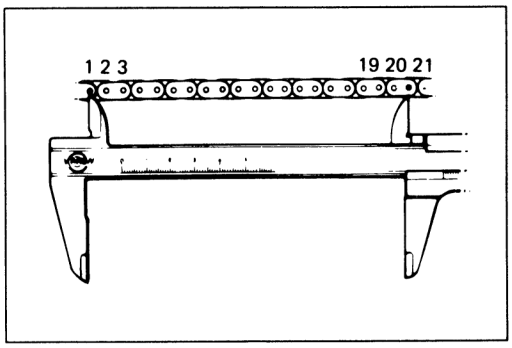


CAM CHAIN LENGTH

Pull the chain tight to remove any slack, then using vernier calipers, measure the 20-pitch length of cam chain. If it measures more than the limit, replace the cam chain.

09900-20102 : Vernier calipers (200 mm)

Cam chain 20-pitch length	Service Limit
	158.0 mm (6.22 in)

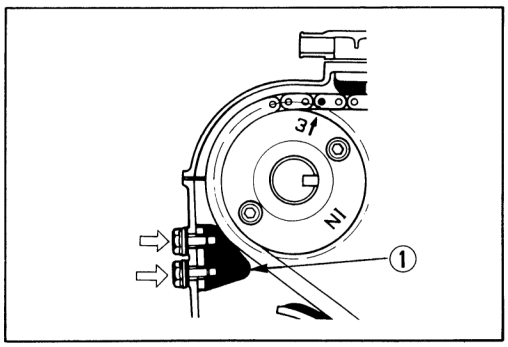


CAM CHAIN GUIDE

NOTE:
When replacing the cam chain guide ①, apply SUZUKI THREAD LOCK SUPER "1303" to threads of bolt.

99000-32030 : THREAD LOCK SUPER "1303"

Cam chain guide mounting bolt : 4 — 7 N·m (0.4 — 0.7 kg-m, 3.0 — 5.0 lb-ft)



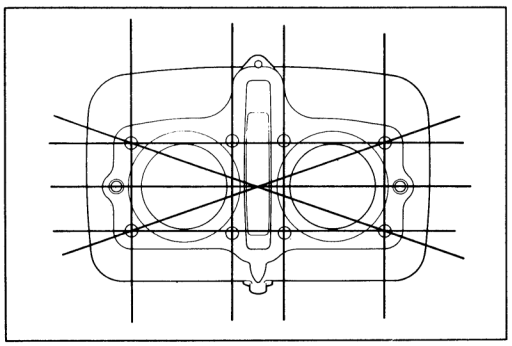
CYLINDER

CYLINDER DISTORTION

Check the gasketed surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.

09900-20803 : Thickness gauge

Cylinder distorsion	Service Limit
	0.10 mm (0.004 in)

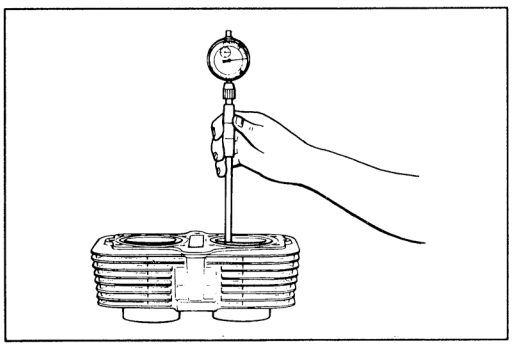


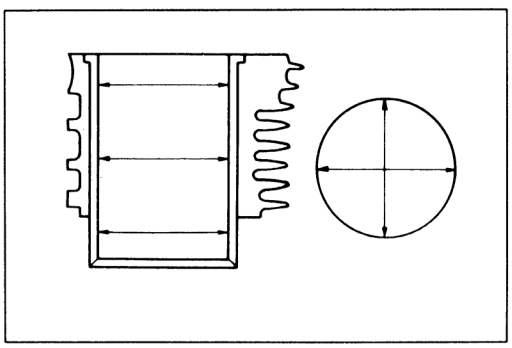
CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, rebore the cylinder and replace the pistons with oversize ohes, or replace the cylinder. It a cylinder was rebored, rebore remaining cylinders simutaneously.

09900-20508 : Cylinder gauge set (40 — 80 mm)

Cylinder bore (STD size)	Service Limit
	74.080 mm (2.9165 in)





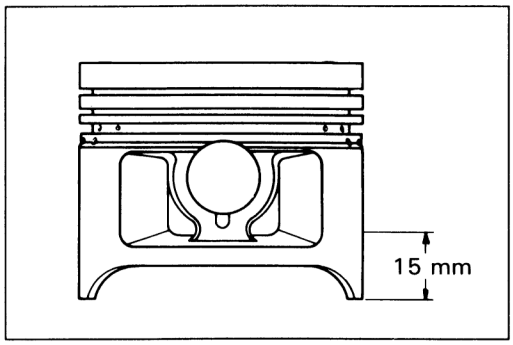
PISTONS

PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place as shown in Fig. If the measurement is less than the limit, replace the piston with a new one.

Piston oversize : 0.5, 1.0 mm

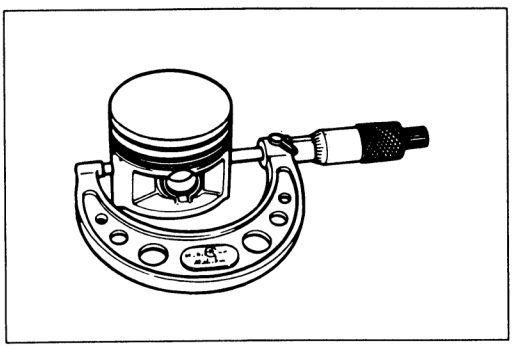
09900-20203 : Micrometer (50 – 75 mm)



Piston diameter (STD size)	Service Limit
	73.880 mm (2.9087 in)

PISTON-CYLINDER CLEARANCE

As a result of the above measurement, if the clearance between the piston and cylinder exceeds the following service limit, treat either to replace with an oversize piston or replacing both cylinder and piston.

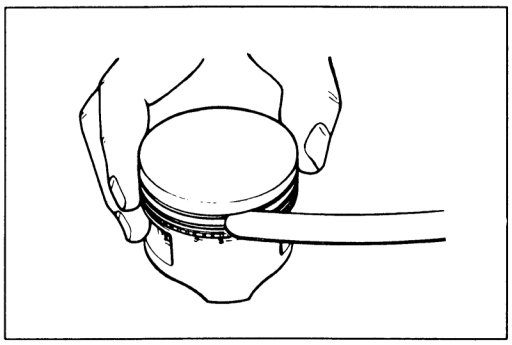


Piston to cylinder clearance	Service Limit
	0.120 mm (0.0047 in)

PISTON RING-GROOVE CLEARANCE

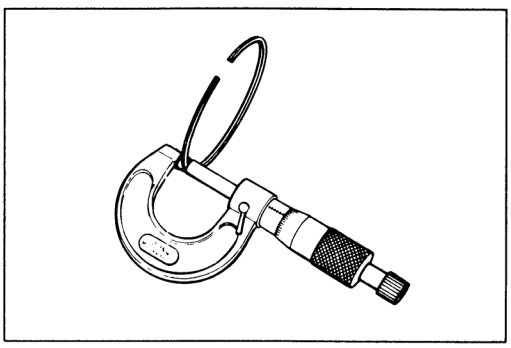
Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

09900-20803 : Thickness gauge



Piston ring to groove clearance	Service Limit
1st	0.18 mm (0.007 in)
2nd	0.15 mm (0.006 in)

Piston ring groove width	Standard
1st & 2nd	1.21 – 1.23 mm (0.047 – 0.048 in)
Oil	2.51 – 2.53 mm (0.099 – 0.100 in)

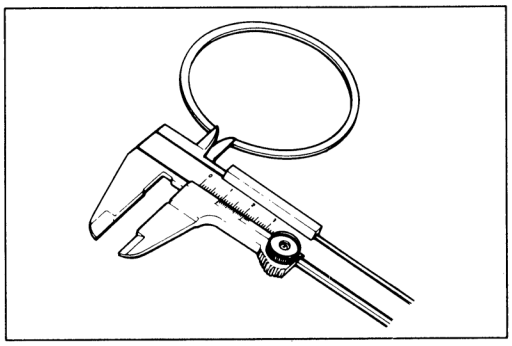


Piston ring thickness	Standard
1st & 2nd	1.17 – 1.19 mm (0.046 – 0.047 in)

PISTON RINGS

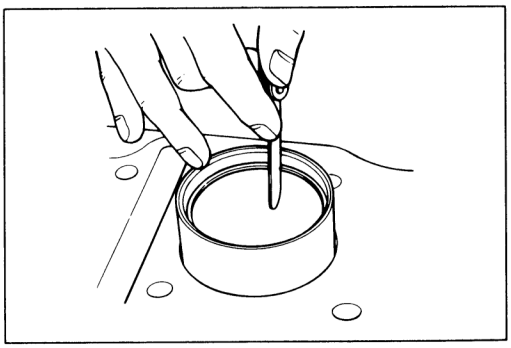
PISTON RING END GAP

Before installing piston rings, measure the free end gap of each ring using a vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
If the free end gap is smaller than service limit, replace it with new one.



09900-20102 : Vernier calipers (200 mm)

Piston ring free end gap		Service Limit
1st	N	5.6 mm (0.22 in)
2nd	N	8.8 mm (0.35 in)



If the end gap is larger than service limit, replace it with new one.

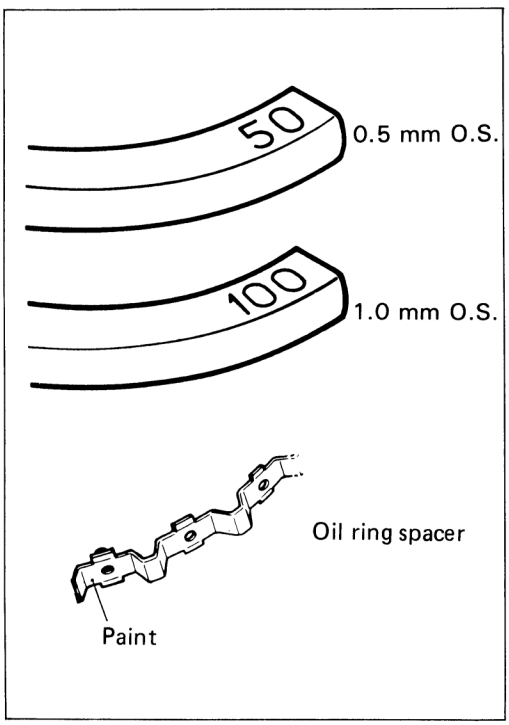
09900-20803 : Thickness gauge

Piston ring end gap	Service Limit
1st & 2nd	0.7 mm (0.03 in)

OVERSIZE PISTON RING

The following two types of oversize piston rings are available. They bear the following identification numbers.

	1st	2nd
0.5 mm	50	50
1.0 mm	100	100



OVERSIZE OIL RING

The following two types of oversize oil ring are available. They bear the following identification marks.

SIZE	COLOR
STD	Painted red
0.5 mm O.S.	Painted blue
1.0 mm O.S.	Painted yellow

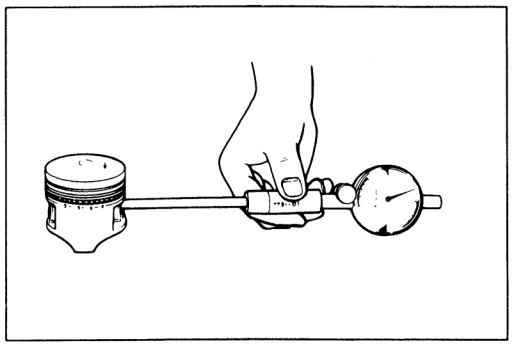
OVERSIZE SIDE RAIL

Just measure out side diameter to identify the size.

PISTON PINS

PISTON PIN BORE

Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the difference between these two measurement is more than the limits, replace both piston and piston pin.

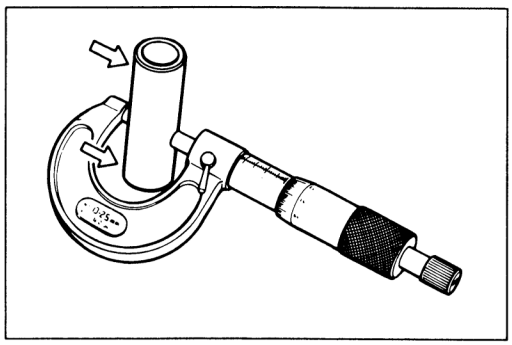


09900-20602 : Dial gauge (1/1000 mm, 1 mm)
09900-22403 : Small bore gauge (18 — 35 mm)
(Not available in U.S.A.)

	Service Limit
Piston pin bore	18.030 mm (0.7098 in)

PISTON PIN DIAMETER

Using a micrometer, measure the piston pin outside diameter at three positions.



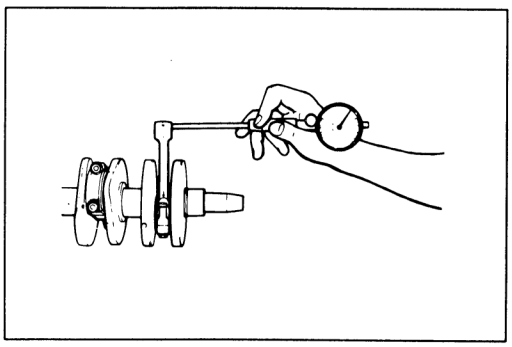
09900-20205 : Micrometer (0 — 25 mm)

	Service Limit
Piston pin O.D.	17.980 mm (0.7079 in)

CONRODS

CONROD SMALL END I.D.

Using a small bore gauge, measure the conrod small end inside diameter.



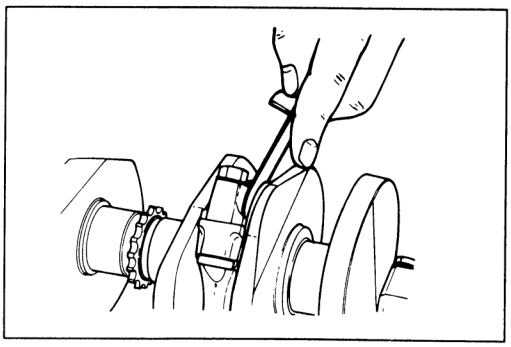
09900-20602 : Dial gauge (1/1000 mm, 1 mm)
09900-22403 : Small bore gauge (18 — 35 mm)
(Not available in U.S.A.)

	Service Limit
Conrod small end I.D.	18.040 mm (0.7102 in)

If the conrod small end inside diameter exceeds the above mentioned limit, replace the conrod.

CONROD BIG END SIDE CLEARANCE

Check the conrod side clearance using a thickness gauge.

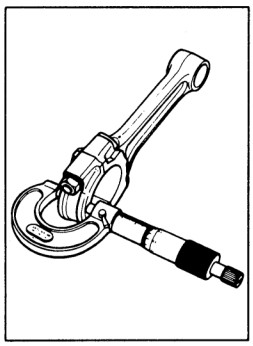


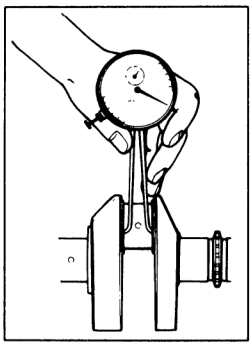
09900-20803 : Thickness gauge

	Service Limit
Conrod big end side clearance	0.3 mm (0.01 in)

If the side clearance exceeds the limit, replace either conrod or crankshaft to measure both widths.

09900-20205 : Micrometer (0 — 25 mm)
09900-20605 : Dial calipers (10 — 34 mm)
(Not available in U.S.A.)

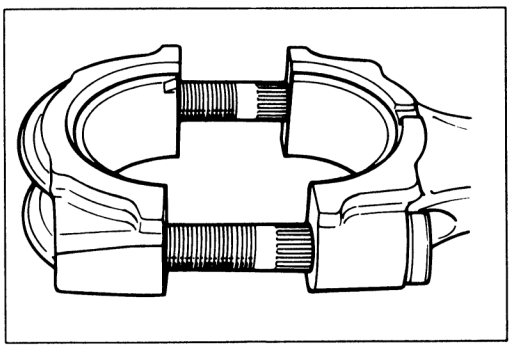




	Standard
Conrod big end width	22.95 — 23.00 mm (0.904 — 0.906 in)
Crank pin width	23.10 — 23.15 mm (0.909 — 0.911 in)

CONROD-CRANK PIN BEARING SELECTION

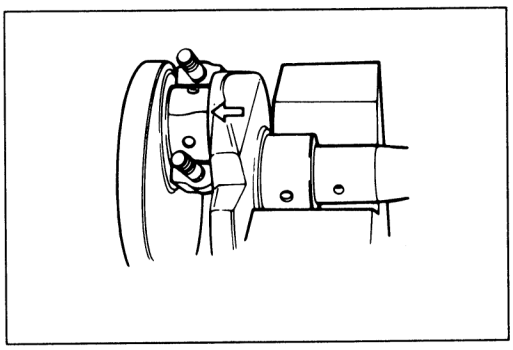
- Loosen the bearing cap nuts, and tap the bolt end lightly with plastic hammer to remove bearing cap.
- Remove the rods, and mark them to identify the cylinder position.
- Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.



NOTE:
Never try to remove the conrod cap bolts because it is impossible to refit the conrod cap bolts tight again.

- Place plastigauge axially on the crank pin avoiding oil hole and at the TDC or BDC side as shown.

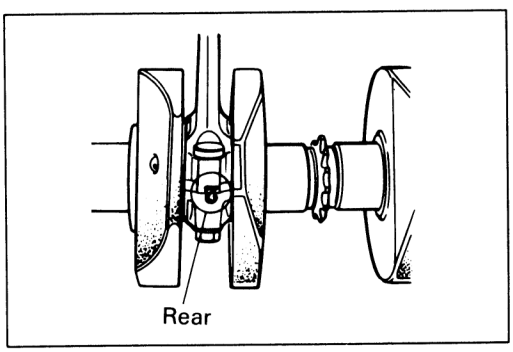
09900-22301 : Plastigauge
(Not available in U.S.A.)



- Tighten the bearing cap with two-step torque values.

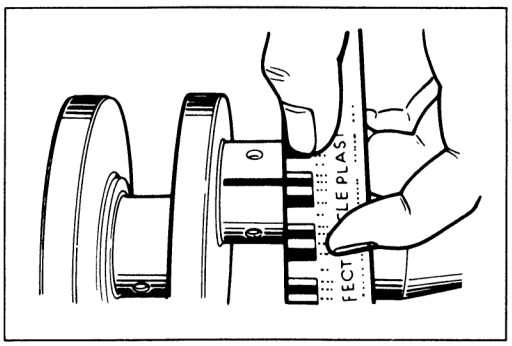
NOTE:
When fitting bearing cap to crank pin, be sure to discriminate one end from the other, namely front and rear.

Conrod bearing cap nut
Initial : 22 — 28 N·m (2.2 — 2.8 kg-m, 16.0 — 20.0 lb-ft)
Final : 30 — 34 N·m (3.0 — 3.4 kg-m, 21.5 — 25.0 lb-ft)



NOTE:
Never rotate the crankshaft or conrod when a piece of the plastigauge is in the clearance.

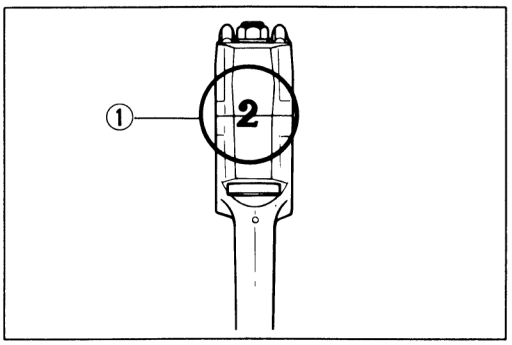
- Remove the caps, and measure the width of compressed plastigauge with its envelope scale. This measurement should be taken at the widest part.

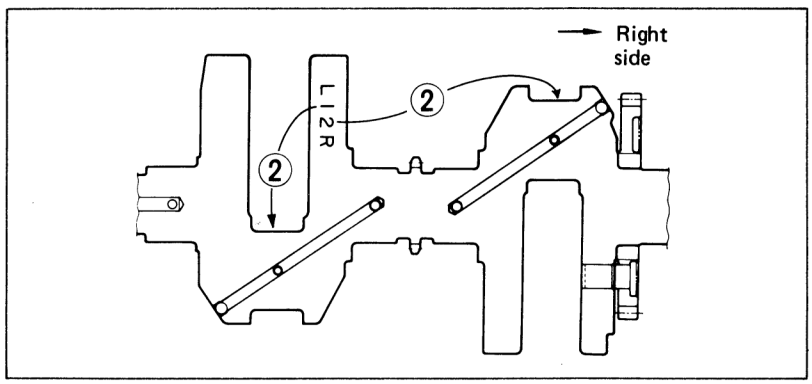


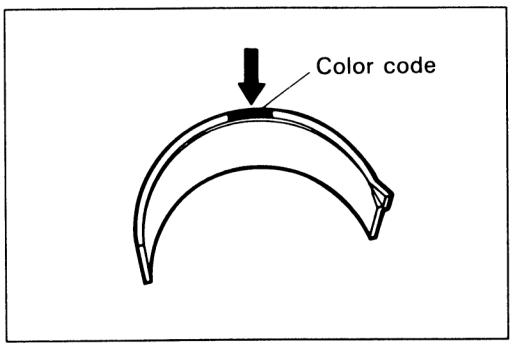
Conrod big end oil clearance	Standard	Service Limit
	0.024 – 0.048 mm (0.0009 – 0.0019 in)	0.080 mm (0.0031 in)

If oil clearance exceeds the service limit, select the specific bearing to refer below table.
The bearing distinguished by color painted is selected easily by the following two steps.

- Check the corresponding conrod I.D. code number ①, "1" or "2".
- Check the corresponding crank pin O.D. code number ②, "1", "2" or "3".







Bearing selection table

		Crank pin O.D. ②		
	Code	1	2	3
Conrod I.D. ①	1	Green	Black	Brown
	2	Black	Brown	Yellow

CAUTION:
Bearing should be replaced as a set.

(REFERENCE DATA)
Conrod I.D. specification

Code	I.D. specification
1	37.000 – 37.008 mm (1.4567 – 1.4570 in)
2	37.008 – 37.016 mm (1.4570 – 1.4573 in)

Crank pin O.D. specification

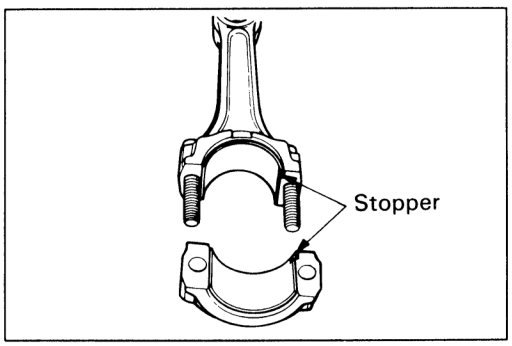
Code	O.D. specification
1	33.992 – 34.000 mm (1.3383 – 1.3386 in)
2	33.984 – 33.992 mm (1.3380 – 1.3383 in)
3	33.976 – 33.984 mm (1.3376 – 1.3380 in)

Bearing thickness specification

Color (Part No.)	Thickness
Green (12164-01D00-0A0)	1.484 – 1.488 mm (0.0584 – 0.0586 in)
Black (12164-01D00-0B0)	1.488 – 1.492 mm (0.0586 – 0.0587 in)
Brown (12164-01D00-0C0)	1.492 – 1.496 mm (0.0587 – 0.0589 in)
Yellow (12164-01D00-0D0)	1.496 – 1.500 mm (0.0589 – 0.0590 in)

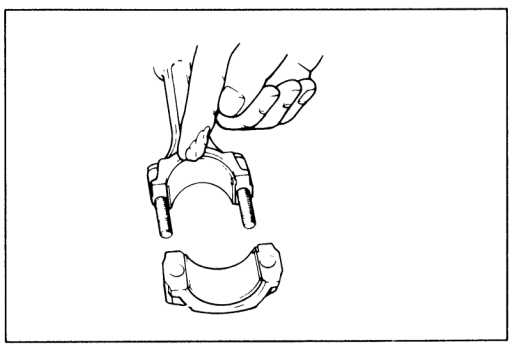
BEARING ASSEMBLY

- When fitting the bearings to the bearing cap and conrod, be sure to fix the stopper part first, and press the other end.



- Apply engine oil or SUZUKI MOLY PASTE to the crank pin and bearing surface.

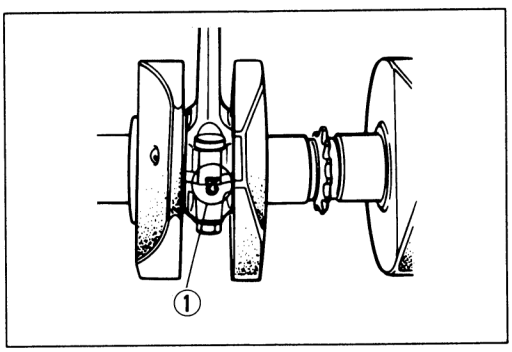
99000-25140 : SUZUKI MOLY PASTE



- When mounting the conrod on the crankshaft, make sure that numeral figure ① of the conrod faces rearward.
- Tighten the conrod fitting nuts with specified torque.

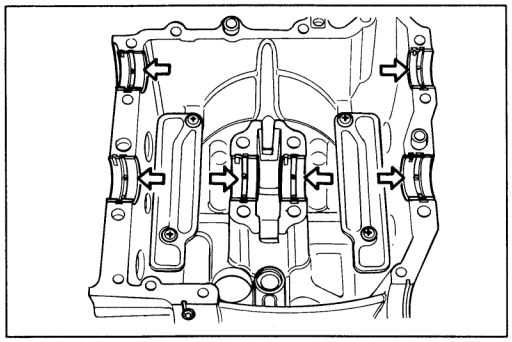
Conrod bearing cap nut : 30 – 34 N·m
(3.0 – 3.4 kg-m,
21.5 – 25.0 lb-ft)

- Check the conrod movement for smooth turning.

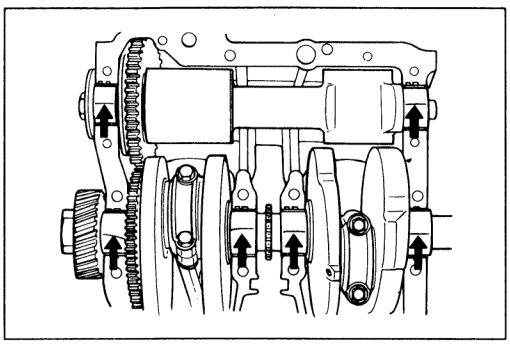


CRANKSHAFT AND COUNTER-BALANCER SHAFT

CRANKCASE-CRANKSHAFT AND COUNTER-BALANCER BEARING SELECTION



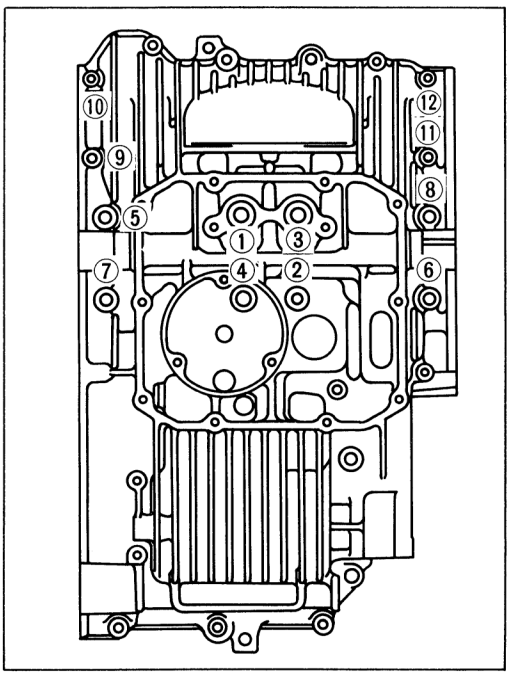
- Inspect each bearing of upper and lower crankcases for any damage.



- Place the plastigauge on each crankshaft and counter-balancer shaft journal in the usual manner.

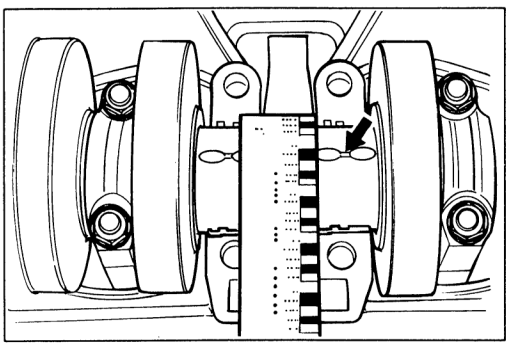
NOTE:
Do not place the plastigauge on the oil hole, and do not rotate the shaft when plastigauge is in place.

09900-22301 : Plastigauge
(Not available in U.S.A.)



- Mate the lower crankcase with the upper crankcase, and tighten the crankshaft/counter-balancer shaft tightening bolts with specified torque value as the indicated order.

Item	Initial	Final
① – ⑧	13 N·m (1.3 kg-m, 9.5 lb-ft)	20 – 24 N·m (2.0 – 2.4 kg-m, 14.5 – 17.5 lb-ft)
⑨ – ⑫	6 N·m (0.6 kg-m, 4.5 lb-ft)	9 – 13 N·m (0.9 – 1.3 kg-m, 6.5 – 9.5 lb-ft)
The other 6 mm bolts	6 N·m (0.6 kg-m, 4.5 lb-ft)	10 N·m (1.0 kg-m, 7.0 lb-ft)
The other 8 mm bolts	13 N·m (1.3 kg-m, 9.5 lb-ft)	20 N·m (2.0 kg-m, 14.5 lb-ft)



- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

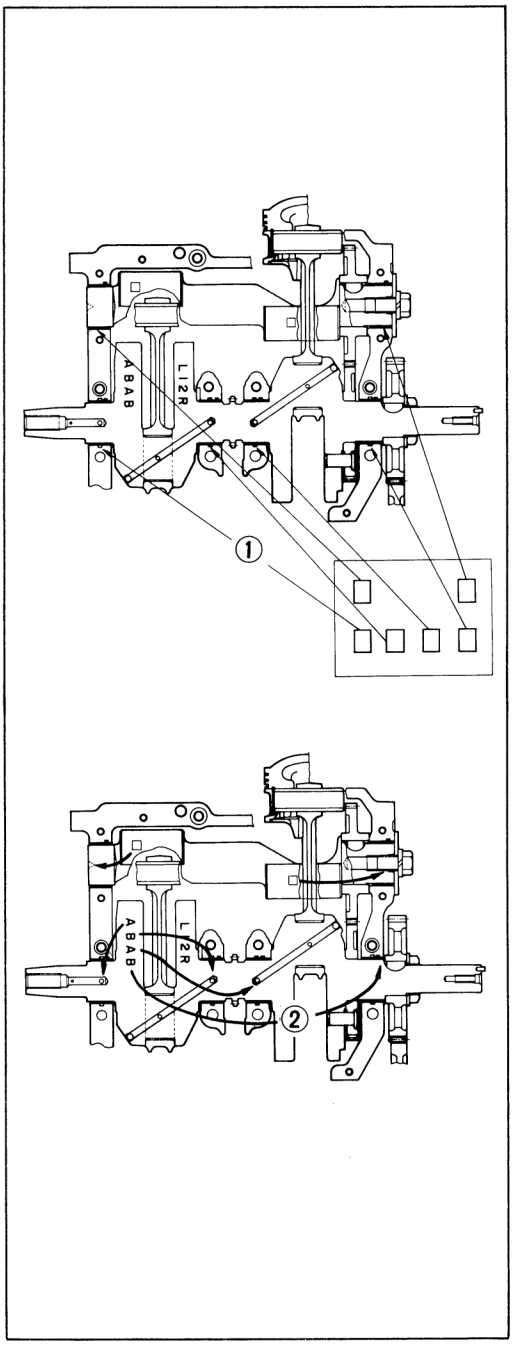
	Standard	Service Limit
Crankshaft and counter-balancer shaft oil clearance	0.020 – 0.044 mm (0.0008 – 0.0017 in)	0.080 mm (0.0031 in)

If the width at the widest part exceeds the limit, replace the set of bearings with new ones to refer the selection table.

- Check the corresponding crankcase journal I.D. code number ① "A" or "B" which are stamped on the rear surface of upper crankcase.
- Check the corresponding crankshaft and counter-balancer shaft journal O.D. code number ② "A", "B" or "C".

Bearing selection table

		Crankshaft and counter-balancer journal O.D. ②		
	Code	A	B	C
Crankcase I.D. ①	A	Green	Black	Brown
	B	Black	Brown	Yellow



CAUTION:
Bearing should be replaced as a set.

(REFERENCE DATA)
Crankcase I.D. specification

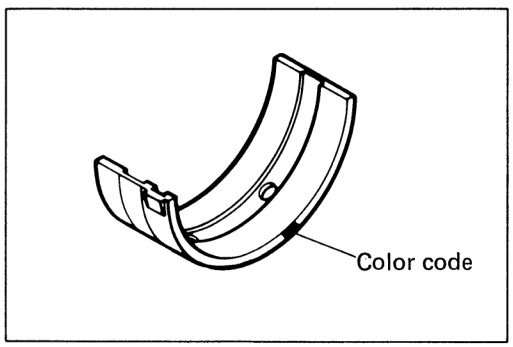
Code	I.D. specification
A	35.000 – 35.008 mm (1.3780 – 1.3783 in)
B	35.008 – 35.016 mm (1.3783 – 1.3786 in)

Crankshaft and counter-balancer shaft journal O.D. specification

Code	O.D. specification
A	31.992 – 32.000 mm (1.2595 – 1.2598 in)
B	31.984 – 31.992 mm (1.2592 – 1.2595 in)
C	31.976 – 31.984 mm (1.2589 – 1.2592 in)

Bearing thickness specification

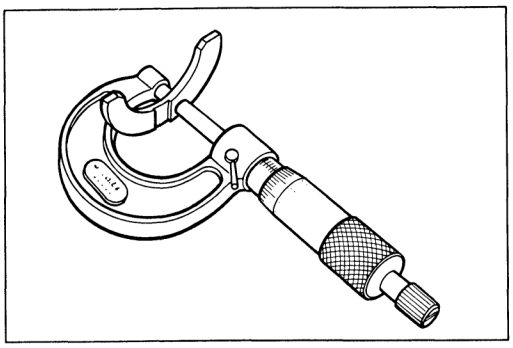
Color (Part No.)	Specification
Green (12229-01D00-0A0)	1.486 – 1.490 mm (0.0585 – 0.0587 in)
Black (12229-01D00-0B0)	1.490 – 1.494 mm (0.0587 – 0.0588 in)
Brown (12229-01D00-0C0)	1.494 – 1.498 mm (0.0588 – 0.0590 in)
Yellow (12229-01D00-0D0)	1.498 – 1.502 mm (0.0590 – 0.0591 in)



CRANKSHAFT THRUST BEARING

- Check the crankshaft thrust bearing thickness for wear. If most wearing portion exceeds the following limit, replace them with new ones as a set.

09900-20205 : Micrometer (1/1000 mm, 0 – 25 mm)

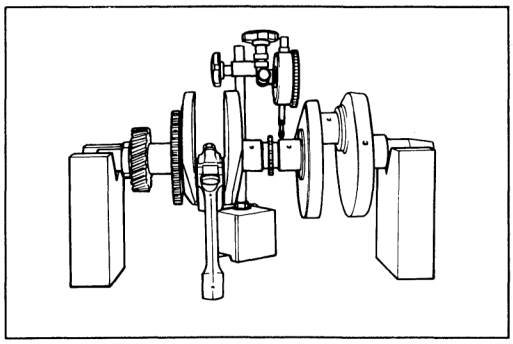


Service Limit	2.85 mm (0.112 in)

CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end journals resting on the blocks. Set up the dial gauge, as shown, and rotate the crankshaft slowly to read the runout. Replace the crankshaft if the runout exceeds the service limit.

09900-20606 : Dial gauge (1/100 mm, 10 mm)
09900-20701 : Magnetic stand
09900-21304 : V-block (100 mm) } **Not available in U.S.A.**



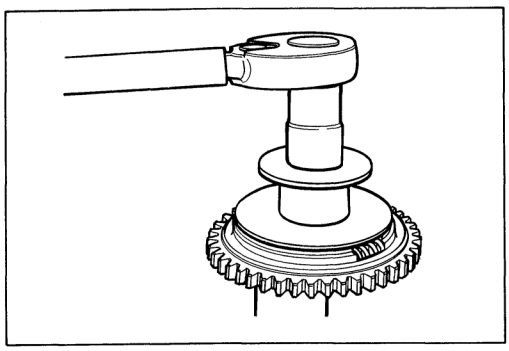
Crankshaft runout	Service Limit
	0.05 mm (0.002 in)

COUNTER-BALANCER SHAFT

DISASSEMBLY

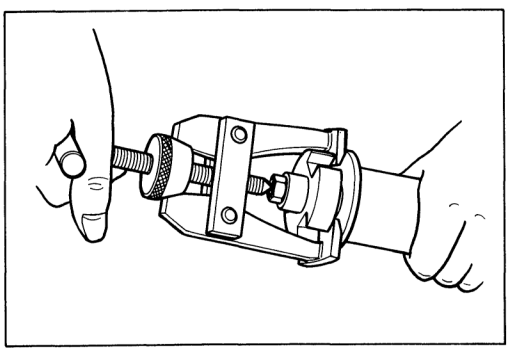
- Remove the counter-balancer shaft setting bolt.
- Remove the washers and spacer along with the driven gear.

NOTE:
Do not lose the damper springs and pins.



- Remove the inner race with the special tool.

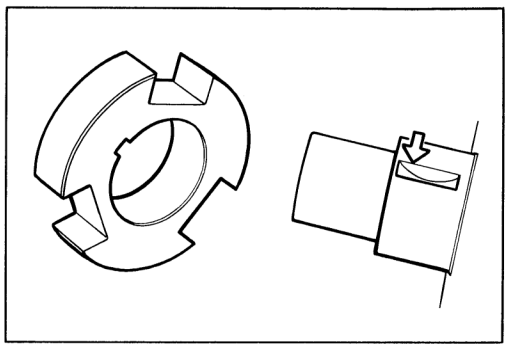
09913-61110 : Bearing puller

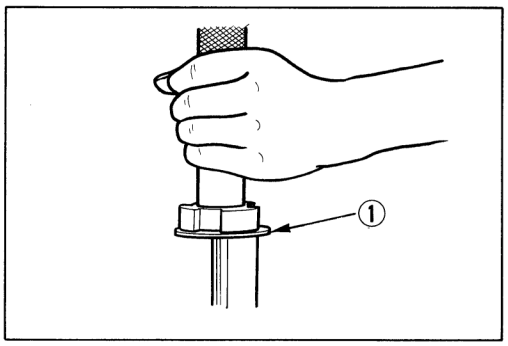


REASSEMBLY

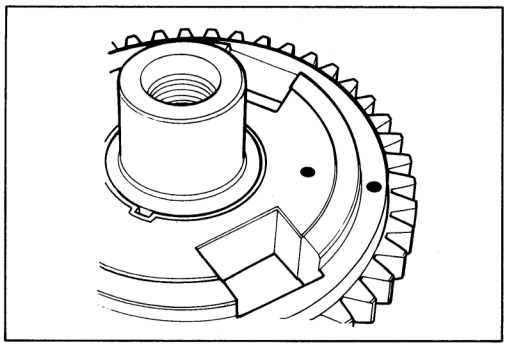
- Locate the washer ① onto the counter-balancer shaft and fit the key in the key slot, then install the inner race to use a hand press as shown.

NOTE:
The Punch-marked side of inner race comes outside.



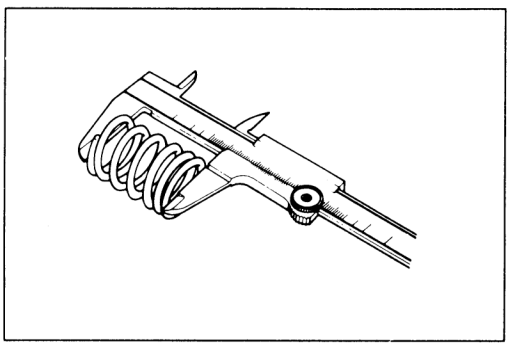


- Align the punched marks on the driven gear and inner race.

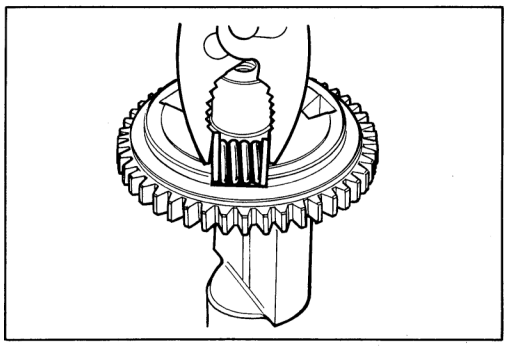


- Check the springs for strength by measuring their free length and if one of them is shorter than limit, replace all of them with new ones.

Service Limit	14.9 mm (0.59 in)

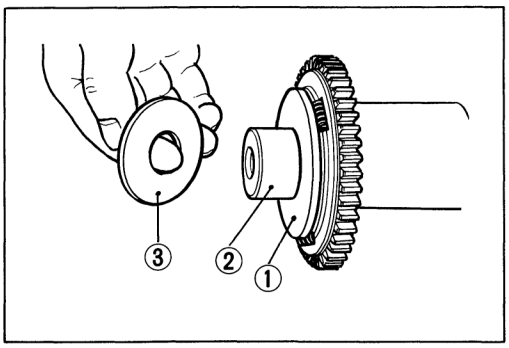


- Install the damper springs and pins with pliers.



- Install the washer ①, spacer ② and washer ③.
- Tighten the counter-balancer shaft setting bolt to the specified torque.

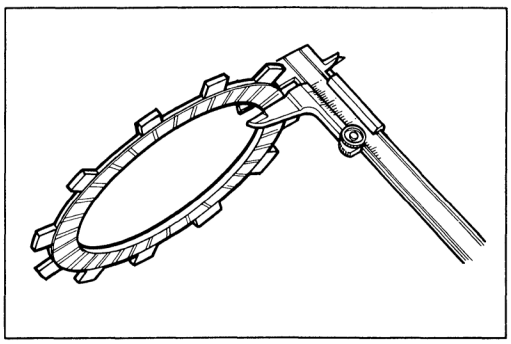
Tightening torque : 35 – 45 N·m
(3.5 – 4.5 kg-m,
25.5 – 32.5 lb-ft)



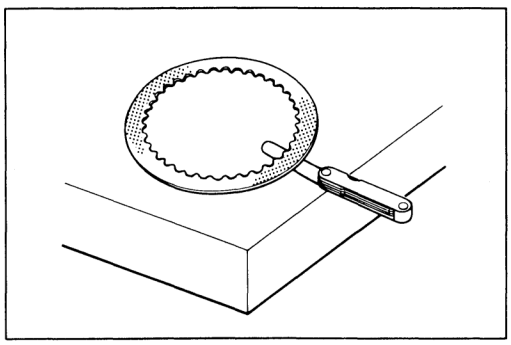
CLUTCH

CLUTCH DRIVE AND DRIVEN PLATES

Clutch plates in service remain in oily condition as they are lubricated with oil. Because of this condition, both drive and driven plates are subject to little wearing action and therefore last much longer. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.
These plates are expendable: they are meant to be replaced when found worn down or distorted to the respective limit: use a vernier calipers to check thickness and a thickness gauge and surface plate to check distortion.



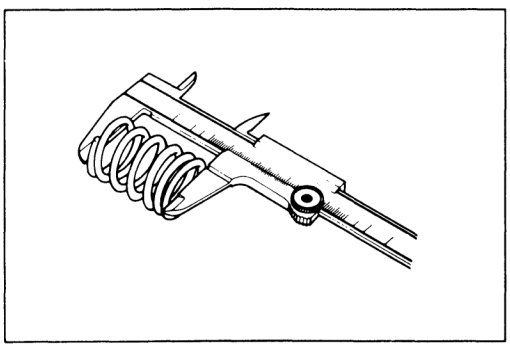
09900-20102 : Vernier calipers (200 mm)
09900-20803 : Thickness gauge



	Standard	Service Limit
Drive plate thickness	2.92 – 3.08 mm (0.115 – 0.121 in)	2.62 mm (0.103 in)
Driven plate distortion	–	0.10 mm (0.004 in)

CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with vernier calipers, and compare the elastic strength of each with the specified limit. Replace all the springs if any one of springs is not within the limit.

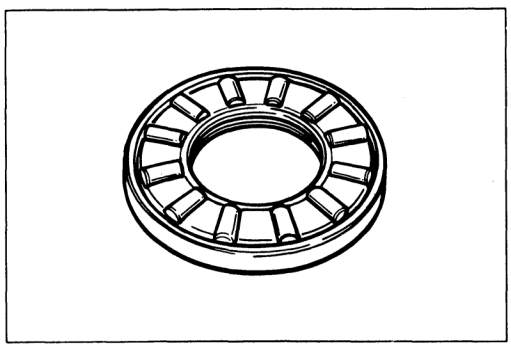


09900-20102 : Vernier calipers (200 mm)

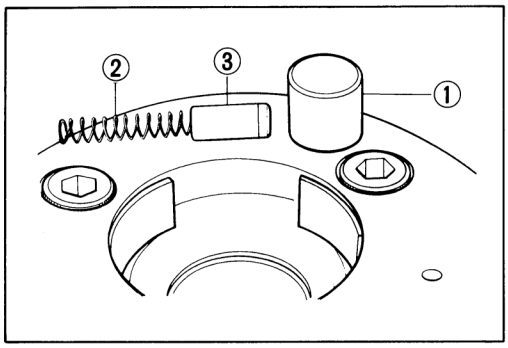
Clutch spring free length	Service Limit
	60.8 mm (2.39 in)

CLUTCH RELEASE BEARING

Inspect the clutch release bearing for any abnormality to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.

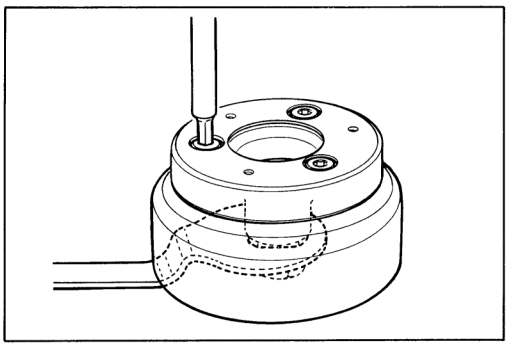


STARTER CLUTCH



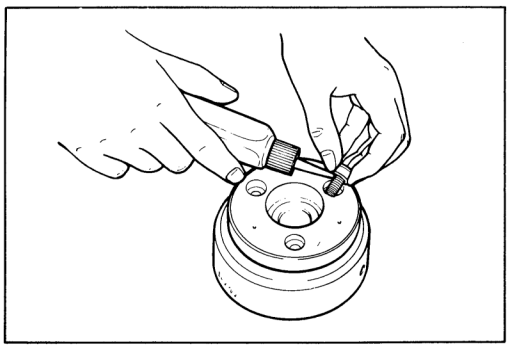
DISASSEMBLY

- Remove the starter driven gear.
- Remove the roller ①, spring ② and push piece ③.



- Hold the generator rotor with the rotor holder and remove the starter clutch securing bolts.

09930-44511 : Rotor holder



REASSEMBLY

- Apply a small quantity of THREAD LOCK SUPER "1303" to the starter clutch securing bolts and tighten them to the specified torque by holding the rotor holder.

99000-32030 : THREAD LOCK SUPER "1303"

Tightening torque : 15 – 20 N·m
(1.5 – 2.0 kg-m,
11.0 – 14.5 lb-ft)

OIL PUMP

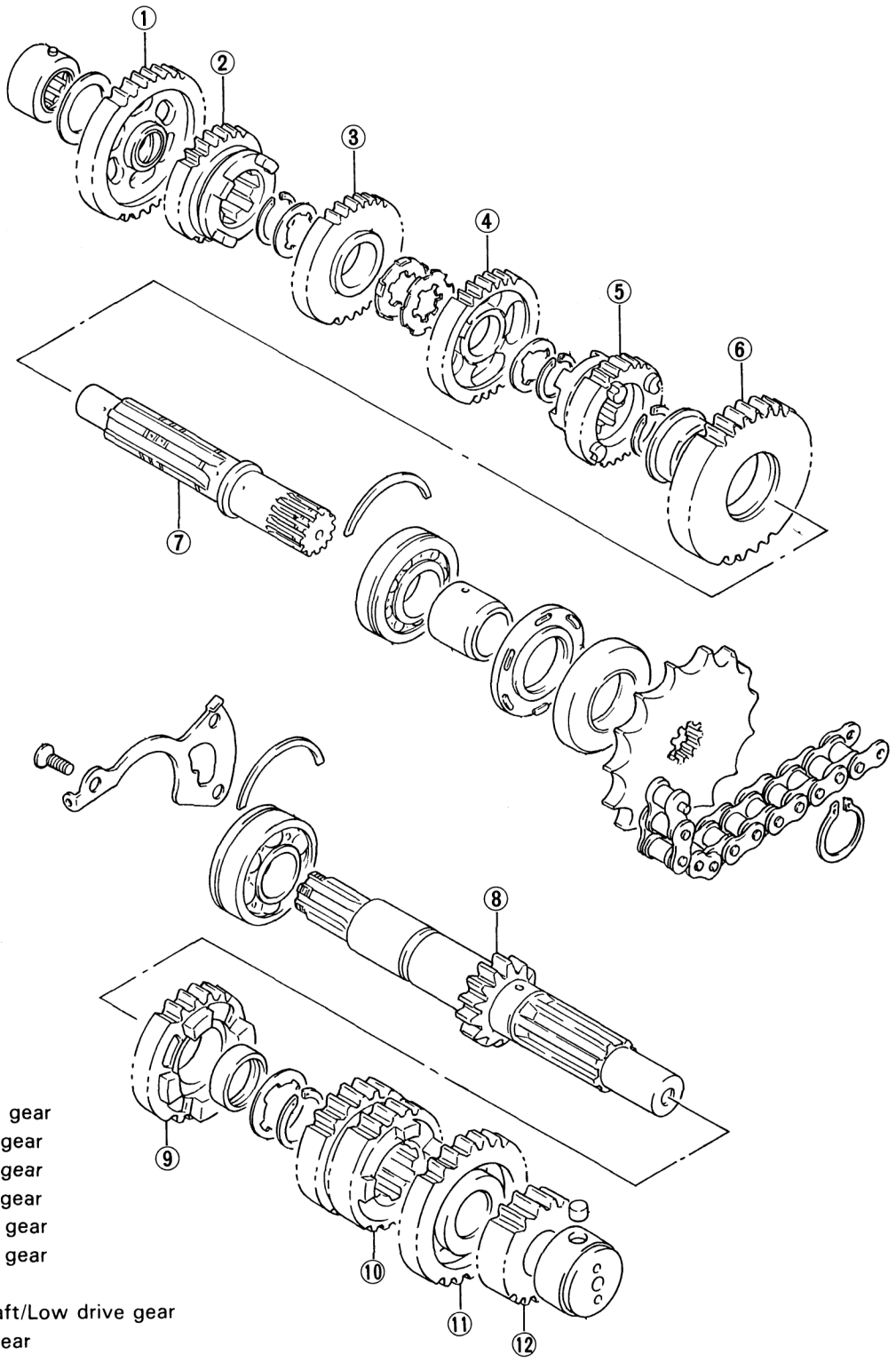
CAUTION:

Do not attempt to disassemble the oil pump assembly.
The oil pump is available only as an assembly.

TRANSMISSION GEARS

DISASSEMBLY

Disassemble the transmission gears as shown in the illustration.



① Low driven gear
② 5th driven gear
③ 4th driven gear
④ 3rd driven gear
⑤ Top driven gear
⑥ 2nd driven gear
⑦ Driveshaft
⑧ Countershaft/Low drive gear
⑨ 5th drive gear
⑩ 3rd/4th drive gear
⑪ Top drive gear
⑫ 2nd drive gear

REASSEMBLY

Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to following points:

NOTE:

* *Before installing the gears, rotate the bearing by hand to inspect for abnormal noise and smooth rotation. If there is any abnormal, replace the bearing with new one.*
* *Before installing the gears, coat lightly moly paste or engine oil on the driveshaft and countershaft.*

99000-25140 : SUZUKI MOLY PASTE

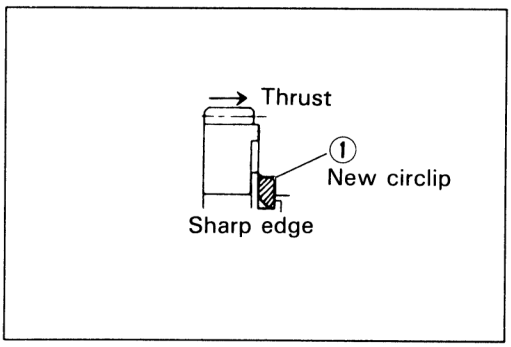
CAUTION:

* **Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.**
* **When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.**
* **After installing a circlip, always insure that it is completely seated in its groove and securely fitted.**

NOTE:

In reassembling the transmission gears, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips. (Refer to page 3-44.)

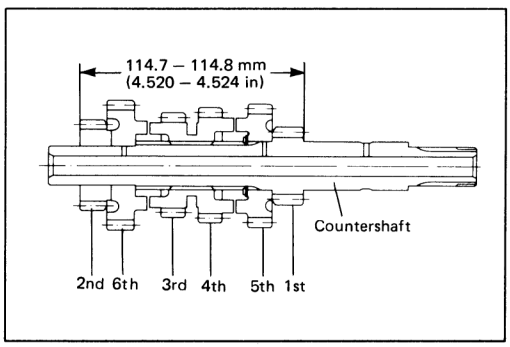
- When installing a new circlip ①, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the illustration.



- Press-fit the 2nd drive gear onto the countershaft.

NOTE:

* *Before reassembling the 2nd drive gear, apply its internal surface with THREAD LOCK SUPER "1303" and install it so that the length as shown in the illustration.*
* *After installing the 2nd drive gear, check that Top drive gear spins smoothly by moving it with your fingers.*
* *This procedure may be performed only twice before shaft replacement is required.*

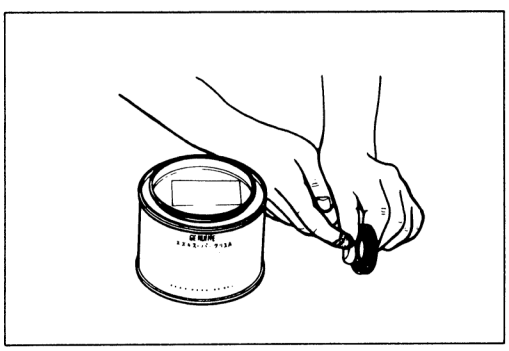


99000-32030 : THREAD LOCK SUPER "1303"

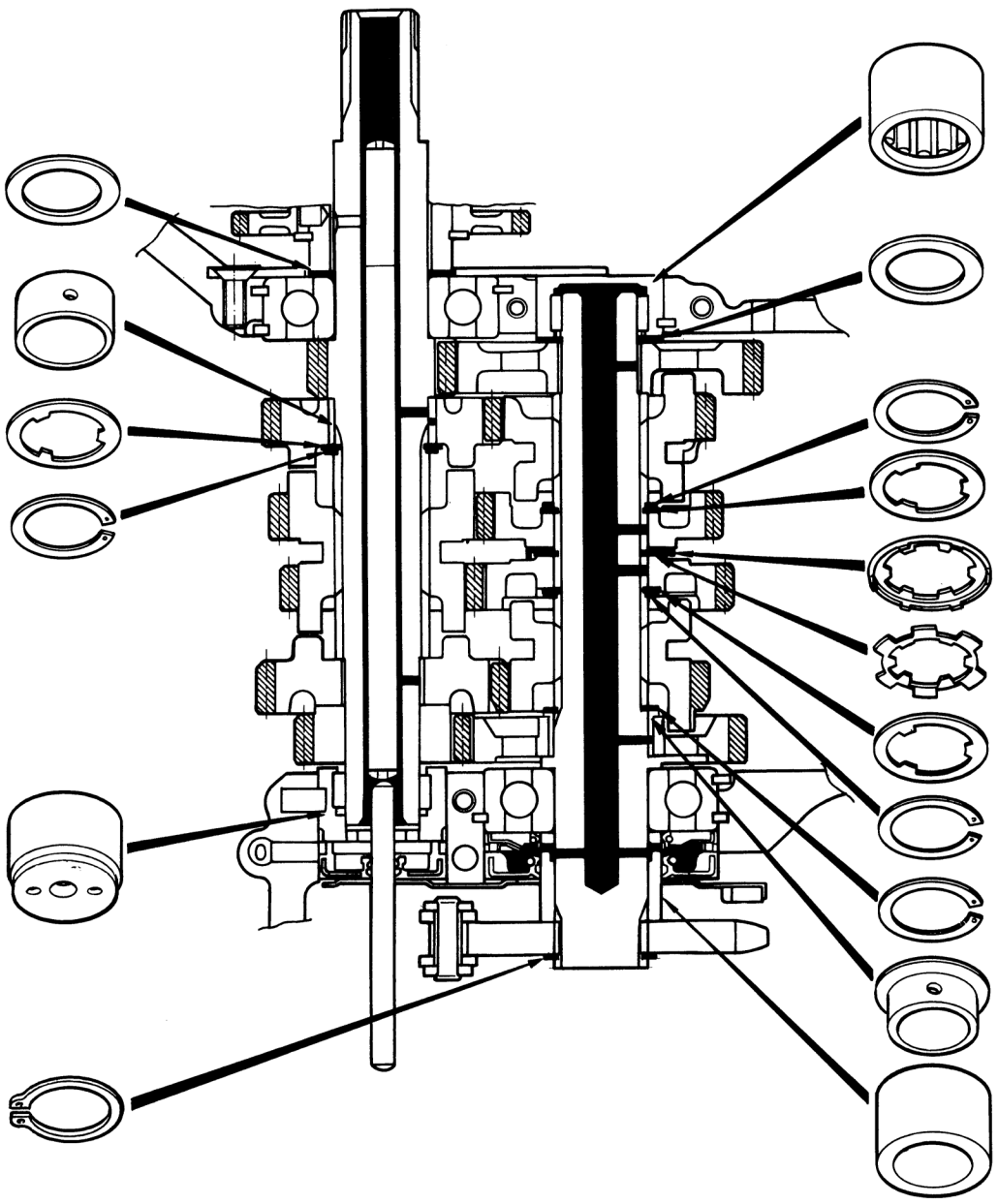
- Apply grease to each oil seal lip and install them onto the driveshaft and countershaft.

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"

(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

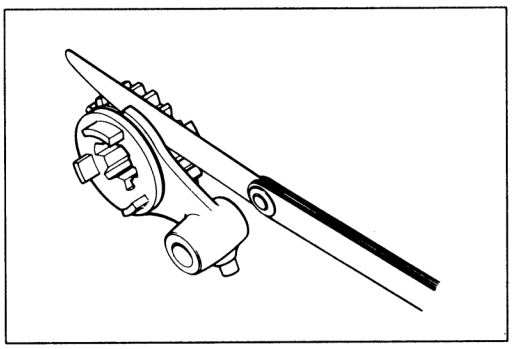


LOCATION OF SMALL PARTS



GEARSHIFT FORK-GROOVE CLEARANCE

Using a thickness gauge, check the gearshift fork clearance in the groove of its gear.
The clearance for each of the three gearshift forks plays an important role in the smoothness and positiveness of shifting action.

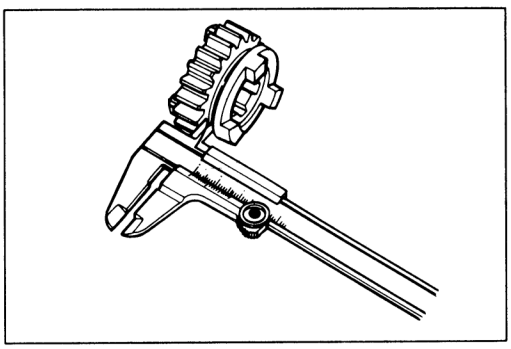


	Standard	Service Limit
Gearshift fork to groove clearance	0.10 — 0.30 mm (0.004 — 0.012 in)	0.50 mm (0.020 in)

If the clearance checked is noted to exceed the standard range mentioned on above, check the following points:

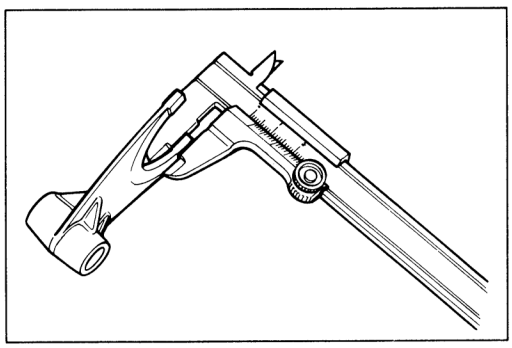
09900-20803 : Thickness gauge
09900-20102 : Vernier calipers (200 mm)

- Check to measure the shift fork groove width with a vernier calipers. If it exceeds the standard, replace its gear with a new one.



	Standard	
Gearshift fork groove width	No. 1, 2 & 3	5.5 — 5.6 mm (0.217 — 0.220 in)

- Check to measure the shift fork thickness with a vernier calipers. If it exceeds the standard, replace the fork with a new one.



	Standard	
Gearshift fork thickness	No. 1, 2 & 3	5.3 — 5.4 mm (0.209 — 0.213 in)

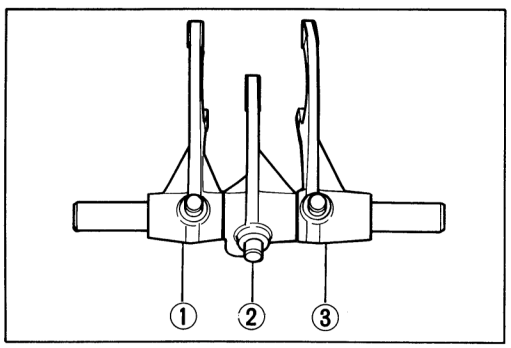
ENGINE REASSEMBLY

The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures.

NOTE:
Apply engine oil to each running and sliding part before reassembling.

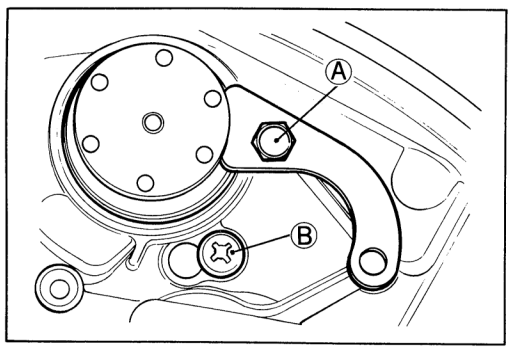
- Install the gearshift forks to the crankcase in the correct position and direction.

① For 5th driven gear
② For 3rd/4th drive gear
③ For Top driven gear

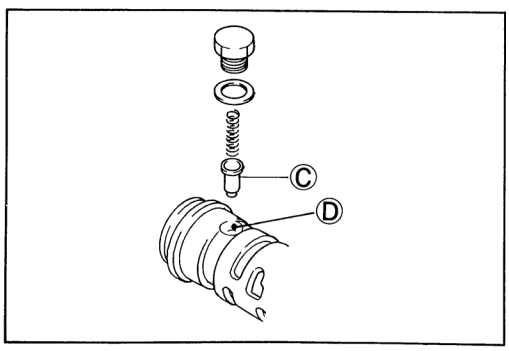


- Apply a small quantity of THREAD LOCK "1342" to the gearshift cam guide bolt Ⓐ and gearshift fork shaft stopper screw Ⓑ.

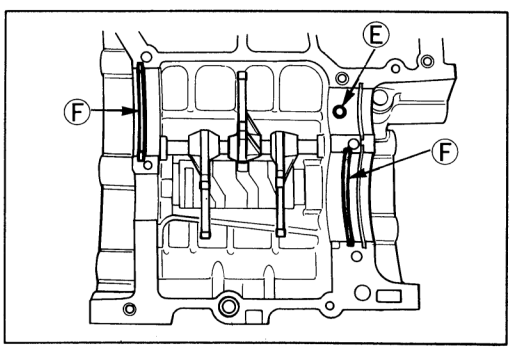
99000-32050 : THREAD LOCK "1342"



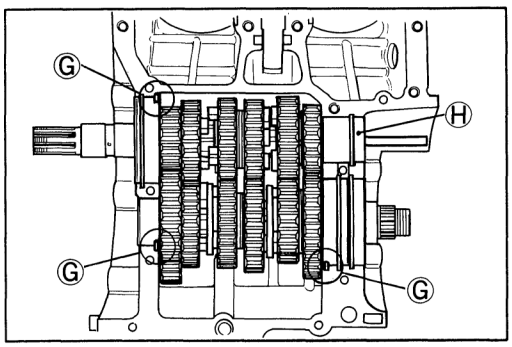
- Meet the neutral positioning stopper Ⓒ with the dent Ⓓ of gearshift cam.



- Fit the bearing pin Ⓔ and C-rings Ⓕ on the upper crankcase.



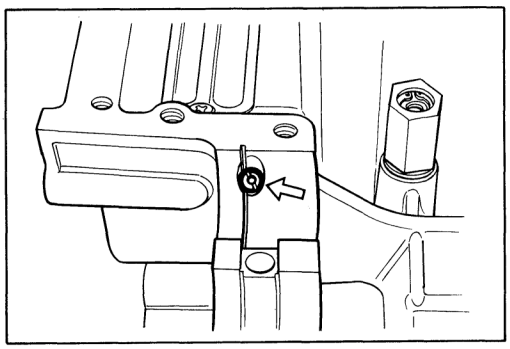
- Install both of the countershaft assembly and driveshaft assembly on the upper crankcase.



NOTE:

* *Be sure to install the bearing dowel pins Ⓖ in their respective positions.*
* *Install the countershaft end cap to the position Ⓗ.*
* *Make sure that the countershaft turns freely while holding the driveshaft. If not, shift the gear to the neutral position.*

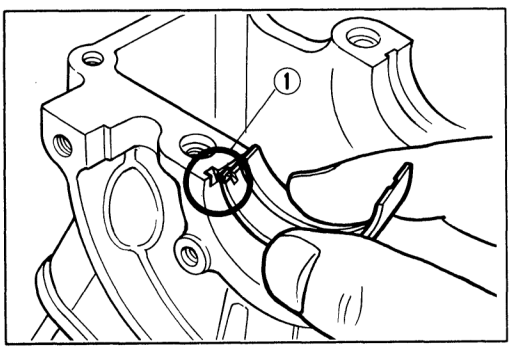
- Check for clogging the oil orifices fitted on the lower crankcase.



OIL ORIFICE LOCATION

* Both sides of the counter-balancer shaft journal
* Countershaft left-side journal

- When fitting the crankshaft and counter-balancer shaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ① first and press the other end.
(Refer to page 3-36.)



CAUTION:
Do not touch the bearing suface with your hands. Grasp by the edge of the bearing shell.

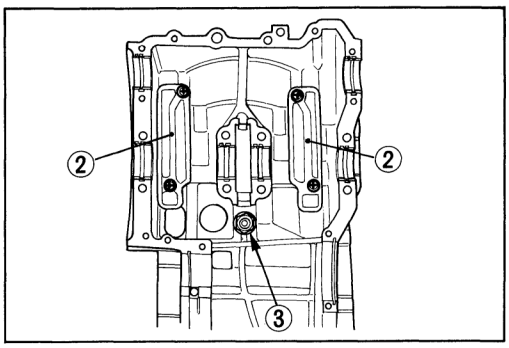
NOTE:

* *When replacing the oil separator plates ② , apply a small quantity of THREAD LOCK "1342" to the screws.*

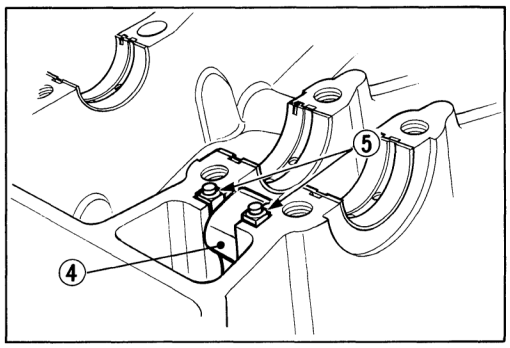
99000-32050 : THREAD LOCK "1342"

* *When replacing the oil pressure regulator ③, tighten it to the specified torque.*

  17 – 20 N·m (1.7 – 2.0 kg-m, 12.5 – 14.5 lb-ft)

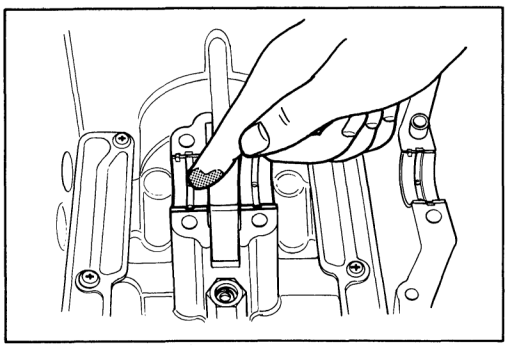


- Install the cam chain guide ④ and two dampers ⑤ properly.



- Before installing the crankshaft and counter-balancer shaft, apply SUZUKI Moly Paste to each journal bearing.

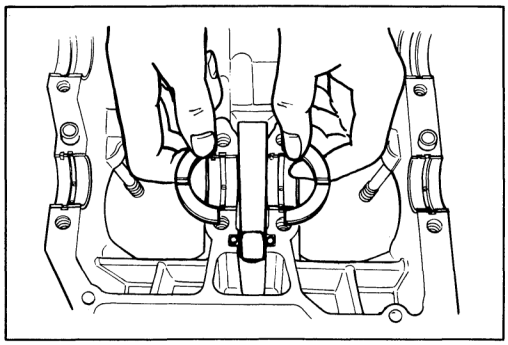
99000-25140 : SUZUKI MOLY PASTE



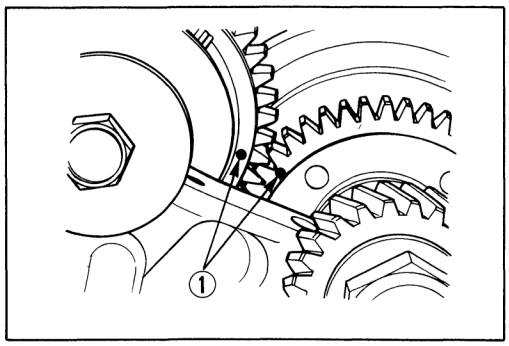
- Insert the right and left-thrust bearings with oil grooved facing the crank web.
- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Install the dowel pins to the upper crankcase.
- Apply SUZUKI Bond No.1207B to the mating surface of the lower crankcase.

(For U.S.A. model)
99104-31140 : SUZUKI BOND NO. 1207B

(For the Other models)
99000-31140 : SUZUKI BOND NO. 1207B

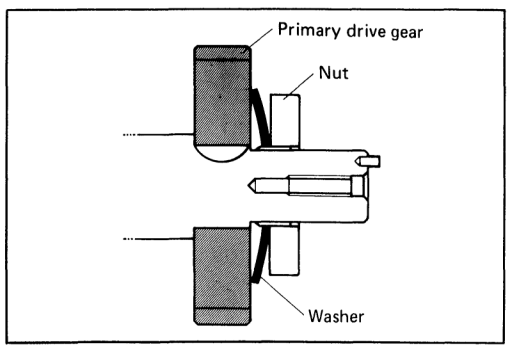


NOTE:
When installing the crankshaft and counter-balancer shaft, be sure to align the punched marks ① on the counter-balancer drive and driven gears.

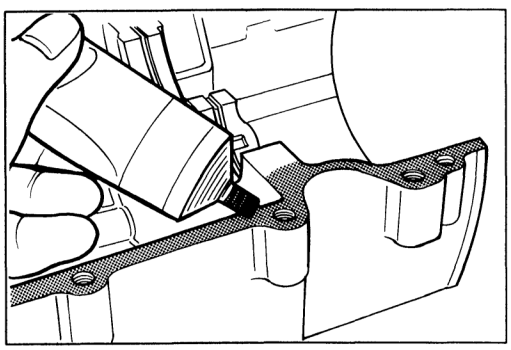


NOTE:
When replacing the primary drive gear, be sure to face the concaved side of washer to the gear as shown.

Primary drive gear nut : 90 – 110 N·m
(9.0 – 11.0 kg-m, 65.0 – 80.0 lb-ft)

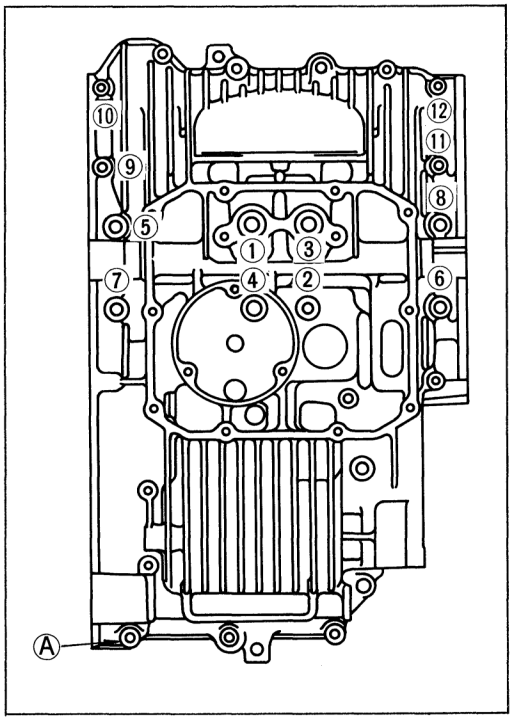


NOTE:
Use of SUZUKI Bond No. 1207B is as follows:
* *Make surfaces free from moisture, oil dust and other foreign materials.*
* *Spread on surfaces thinly to form an even layer, and assmble the cases within few minutes.*
* *Take extreme care not to apply any bond No. 1207B to the bearing surfaces.*
* *Apply to distorted surface as it forms a comparatively thick film.*



- Tighten the crankshaft/counter-balancer shaft tightening bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten the lower and upper crankcase securing bolts and nuts to the specified torque value.

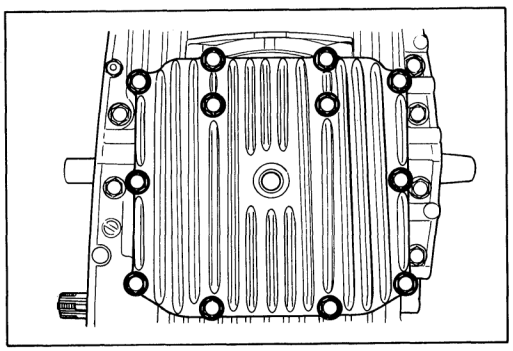
Item	Initial	Final
① – ⑧	13 N·m (1.3 kg-m, 9.5 lb-ft)	20 – 24 N·m (2.0 – 2.4 kg-m, 14.5 – 17.5 lb-ft)
⑨ – ⑫	6 N·m (0.6 kg-m, 4.5 lb-ft)	9 – 13 N·m (0.9 – 1.3 kg-m, 6.5 – 9.5 lb-ft)
The other 6 mm bolts	6 N·m (0.6 kg-m, 4.5 lb-ft)	10 N·m (1.0 kg-m, 7.0 lb-ft)
The other 8 mm bolts	13 N·m (1.3 kg-m, 9.5 lb-ft)	20 N·m (2.0 kg-m, 14.5 lb-ft)



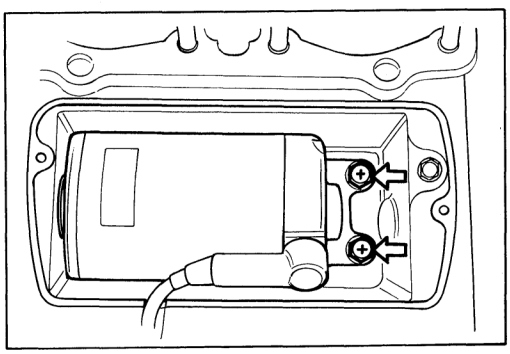
NOTE:
Fit up the engine ground wire to the crankcase securing bolt Ⓐ correctly as shown in the illustration.

- Install the oil sump filter. (See page 3-16.)
- Fit a new gasket and install the oil pan.

Tightening torque
Oil pan bolt : 10 N·m (1.0 kg-m, 7.0 lb-ft)



- Install the starter motor with two bolts.



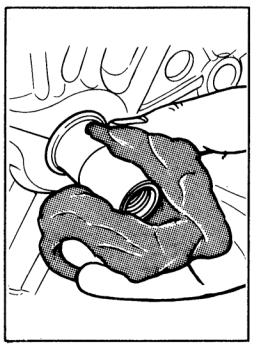
NOTE:
** Apply SUZUKI SUPER GREASE "A" to the starter motor O-ring.*
** Apply a small quantity of THREAD LOCK "1342" to the bolts.*

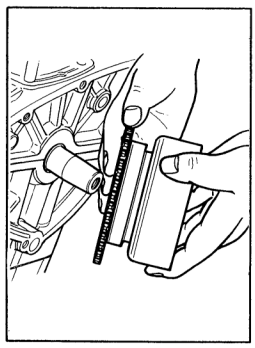
99000-32050 : THREAD LOCK "1342"

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"

(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

- Degrease the tapered portion of the generator rotor and also the crankshaft. Use nonflammable cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.





NOTE:
Apply a small quantity of THREAD LOCK SUPER "1303" to the thread of generator rotor mounting bolt.

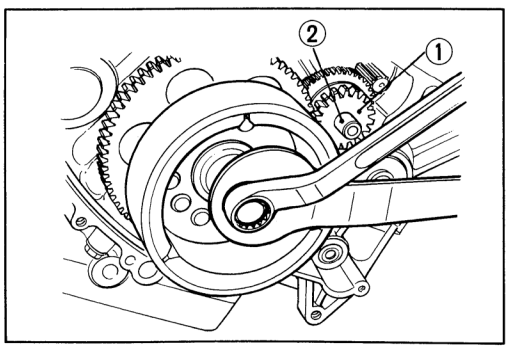
(For U.S.A. model)
99000-32030 : THREAD LOCK SUPER "1303"

(For the other models)
99000-32100 : THREAD LOCK SUPER "1305"

- Tighten the generator rotor mounting bolt to the specified torque.

Generator rotor : 110 – 130 N·m
mounting bolt (11.0 – 13.0 kg-m, 79.5 – 94.5 lb-ft)

09930-44511 : Generator rotor holder

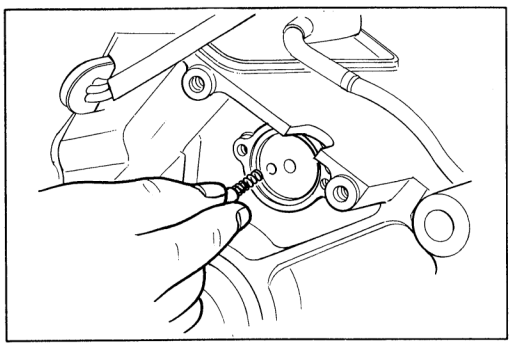


- Install the starter idle gear ① and its shaft ②.
- Coat SUZUKI Bond No.1207B lightly to the portion around mating surface between upper and lower crankcases.

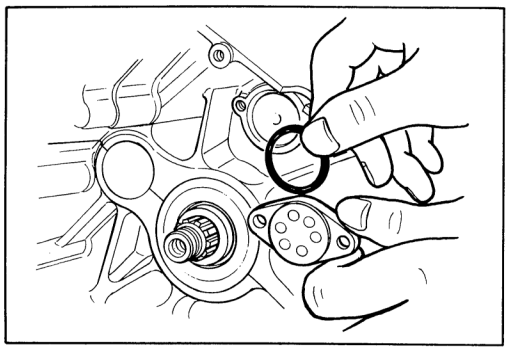
(For U.S.A. model)
99104-31140 : SUZUKI BOND NO.1207B

(For the other models)
99000-31140 : SUZUKI BOND NO.1207B

- Install the neutral position indicator switch with two screws.



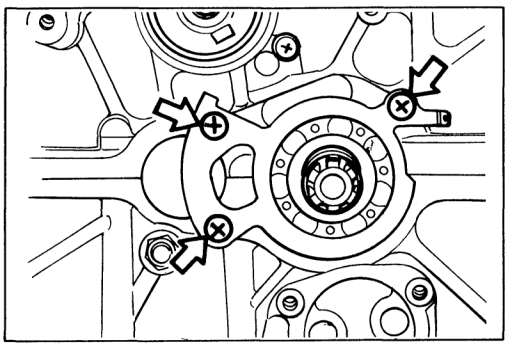
NOTE:
When installing the neutral position indicator switch, be sure to locate the spring, switch contact and O-ring.



- Install the bearing retainer with three screws.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the three screws.

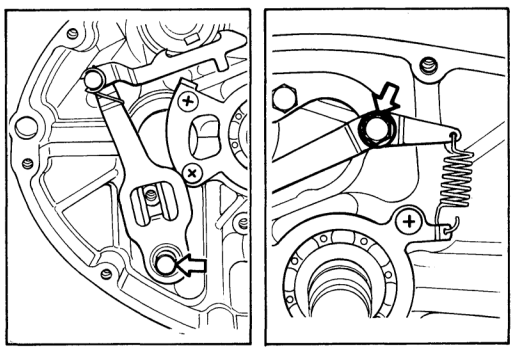
99000-32050 : THREAD LOCK "1342"



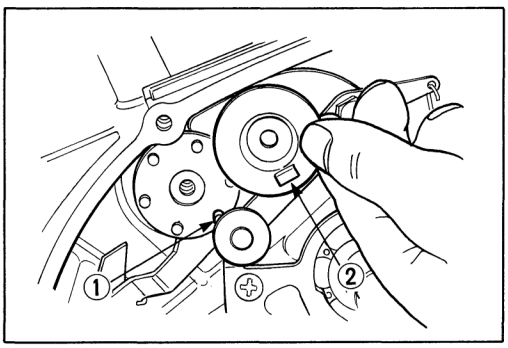
- Install the gearshift shaft assembly.
- Install the gearshift cam stopper with bolt and hook the spring to the bearing retainer.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bolt.

99000-32050 : THREAD LOCK "1342"

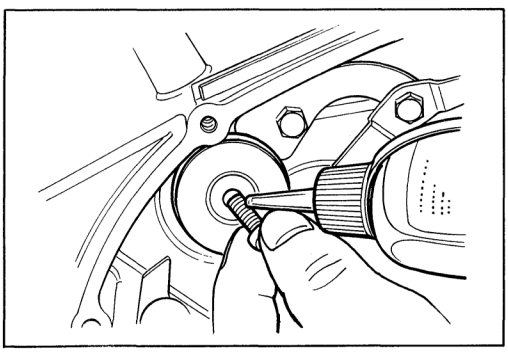


- Bring the gearshift cam to the "NEUTRAL" position.
- Insert the neutral cam pin ① into the gearshift cam to contact it with the gearshift cam stopper.
- Mate the recess ② of gearshift cam pin retainer with the neutral cam pin ①.



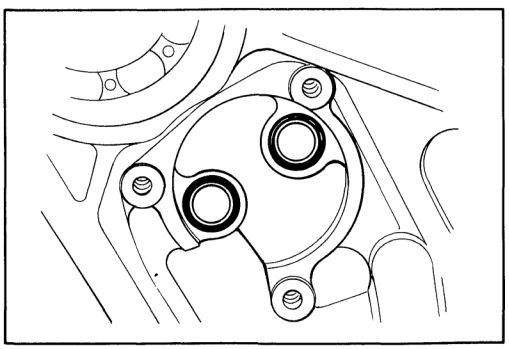
- Apply a small quantity of THREAD LOCK SUPER "1303" to the gearshift cam pin retainer screw.

99000-32030 : THREAD LOCK SUPER "1303"

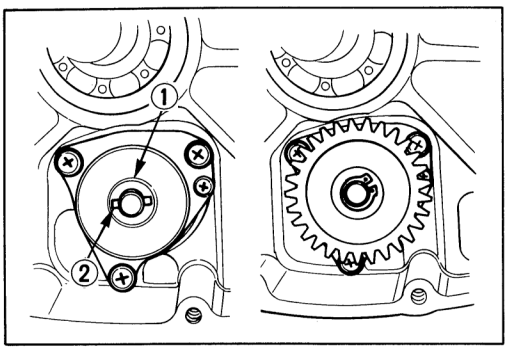


- Fit the O-rings of oil pump to the correct position.

CAUTION:
Replace the O-rings with new ones to prevent oil leakage.



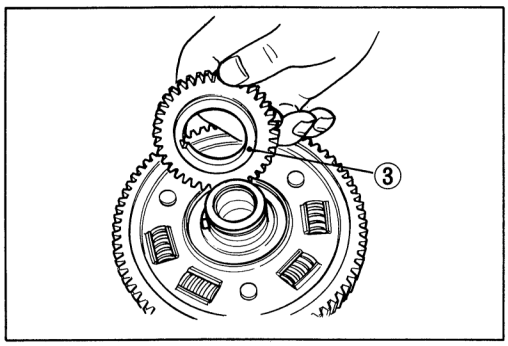
- Apply a small quantity of THREAD LOCK "1342" to the oil pump mounting screws.
- Install the washer ① and pin ②.
- Fix the oil pump driven gear with the circlip.



99000-32050 : THREAD LOCK "1342"

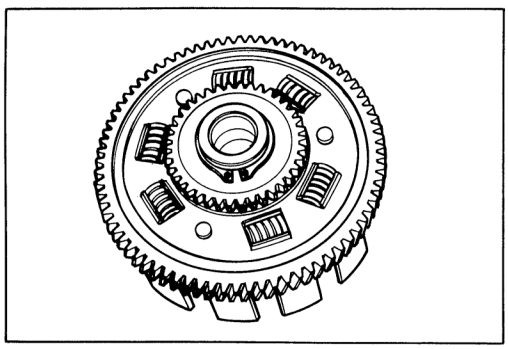
09900-06107 : Snap ring pliers

NOTE:
When installing the oil pump drive gear onto the primary driven gear, be sure to face the toll boss ③ of driven gear to the clutch side.

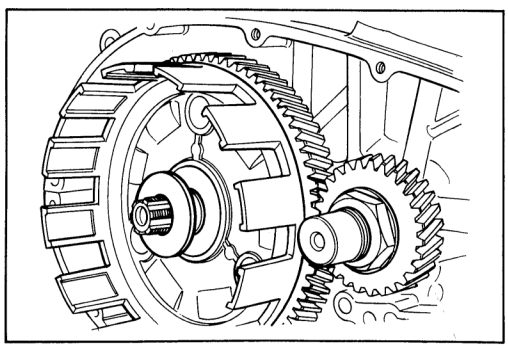


- Fix the oil pump driven gear with circlip.

09900-06107 : Snap ring pliers



- Install the thrust washer onto the countershaft and apply engine oil to the bush of primary driven gear.
- Install the primary driven gear assembly onto the countershaft, then install the thrust washer onto the countershaft.

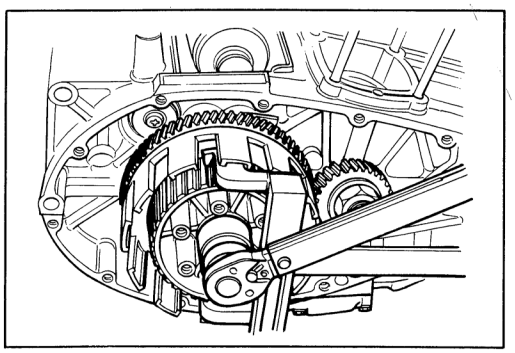


- Tighten the clutch sleeve hub nut to the specified torque.

Clutch sleeve hub nut : 40 – 60 N·m (4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)

09920-53710 : Clutch sleeve hub holder

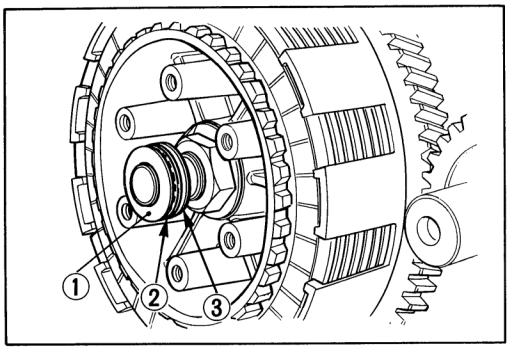
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer.



- Insert the clutch push rods into the countershaft.
- Insert the drive and driven plate one by one into the sleeve hub.

NOTE:
Be sure to insert the drive plate first.

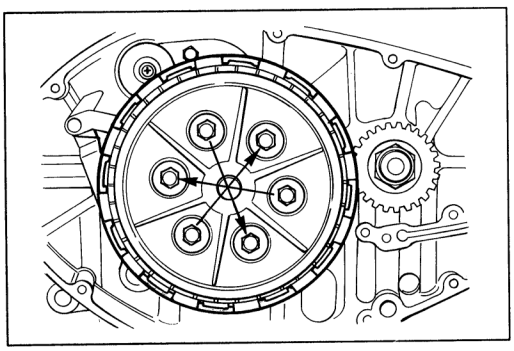
- Install the washer ①, bearing ② and push piece ③.



- Tighten the clutch spring set bolts in the order.

NOTE:
Tighten the clutch spring set bolts in the manner indicated, tightening them by degrees until they attain a uniform tightness.

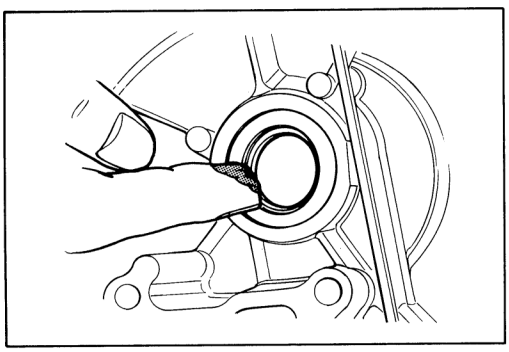
Clutch spring set bolt : 4 – 6 N·m
(0.4 – 0.6 kg-m, 3.0 – 4.5 lb-ft)



- Apply grease to the lip of crankshaft oil seal.

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"

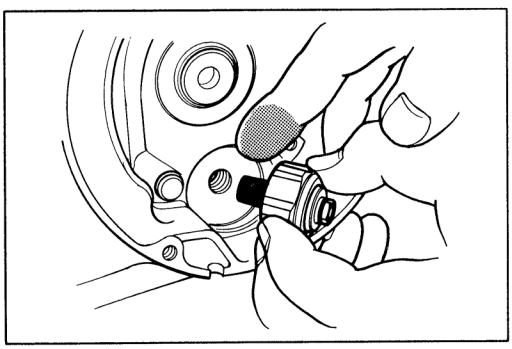
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"



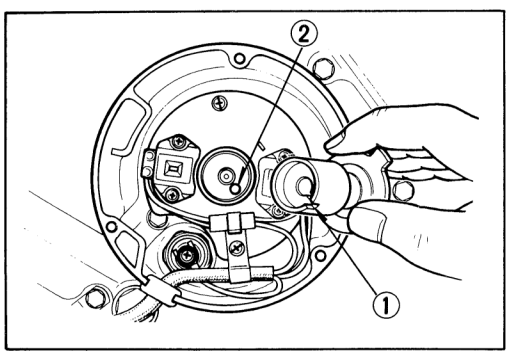
NOTE:
When replacing the oil pressure switch, apply SUZUKI Bond No. 1207B to its thread lightly.

(For U.S.A. model)
99104-31140 : SUZUKI BOND NO.1207B

(For the other models)
99000-31140 : SUZUKI BOND NO.1207B

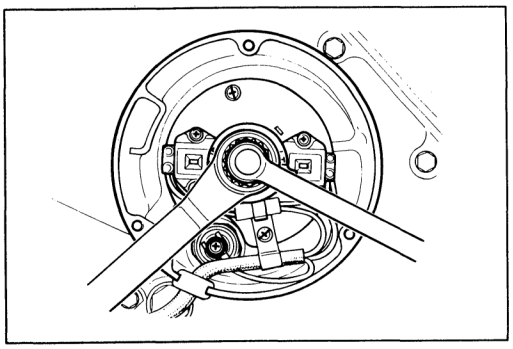


- Install the signal generator stator with two screws.
- Make sure to fit the slot ① on the back surface of the signal generator rotor over the locating pin ② at the end of crankshaft.



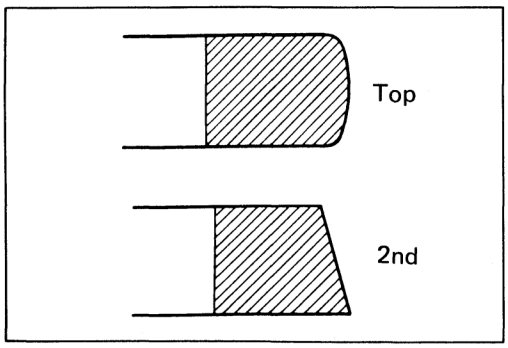
- Hold the crankshaft turning nut and tighten the rotor bolt with specified torque.

Signal generator: 17 — 23 N·m
rotor bolt (1.7 — 2.3 kg-m, 12.5 — 16.5 lb-ft)

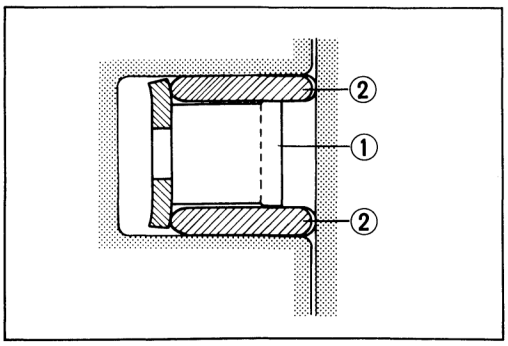


- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- Top ring and 2nd (middle) ring differ in the shape of ring face, and the face of top ring is chrome-plated whereas that of ring is not.
- Top and 2nd (middle) rings have letter "N" marked on the side.

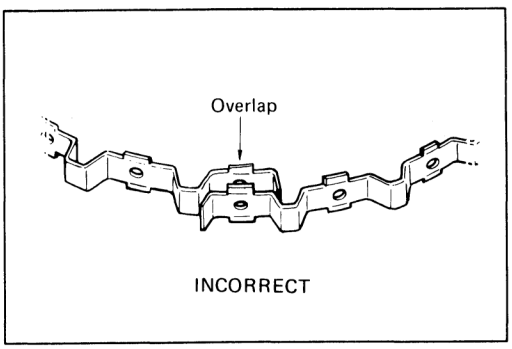
NOTE:
Be sure to bring the marked side to top when fitting to the piston.



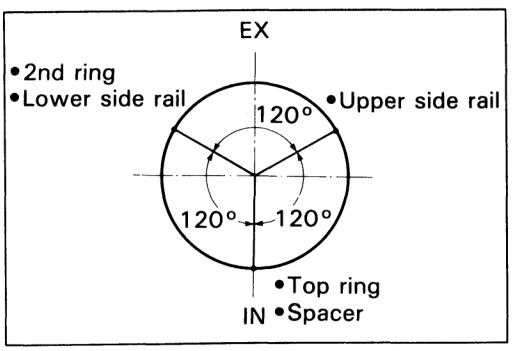
- The first member to go into the oil ring groove is spacer ①. After placing spacer, fit the two side rails ②.



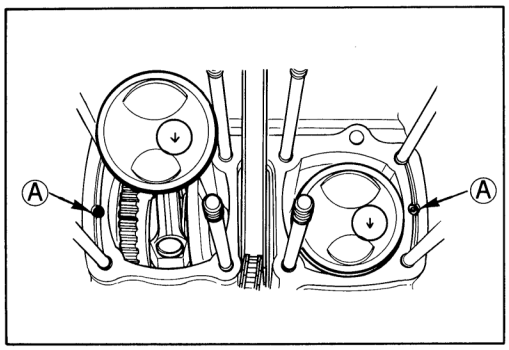
CAUTION:
When installing the spacer, be careful not to allow its two ends to overlap in the groove.



- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.

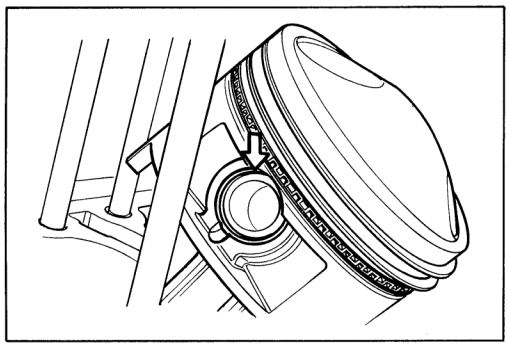


- Check for clogging the oil jets Ⓐ fitted on the crankcase.
- The piston is correct position when its arrow (on the top) points forward.



- Have each piston pin oiled lightly before installing it.
- Place a cloth beneath the piston, and install the circlips.

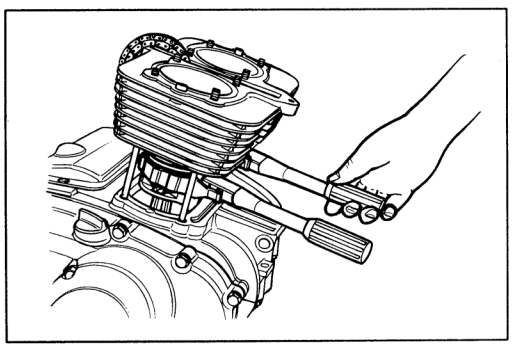
NOTE:
Be sure to use new circlips.



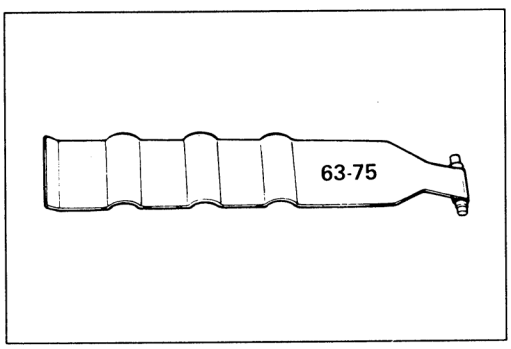
- Before assembling on the cylinder block, oil the big and small ends of each conrod and also the sliding surface of each piston.
- Place the dowel pins and new cylinder gasket on the crankcase.

- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.

09916-74521 : Holder body
09916-74540 : Band (bore 63 — 75 mm)



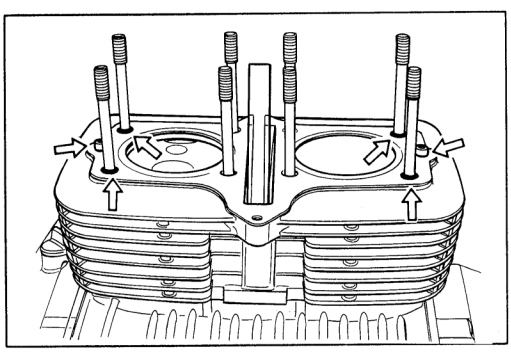
NOTE:
* *Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.*
* *Each band has a number punchmarked on it. The number refers to a particular range of piston sizes.*



- Place the four O-rings and two dowel pins on the cylinder.

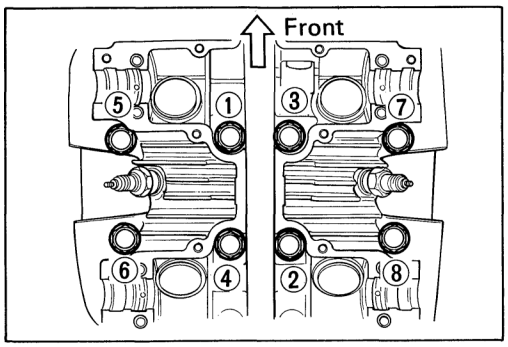
CAUTION:
Replace the O-rings with new ones to prevent oil leakage.

- Be sure to replace the cylinder head gasket with new one to prevent gas leakage.



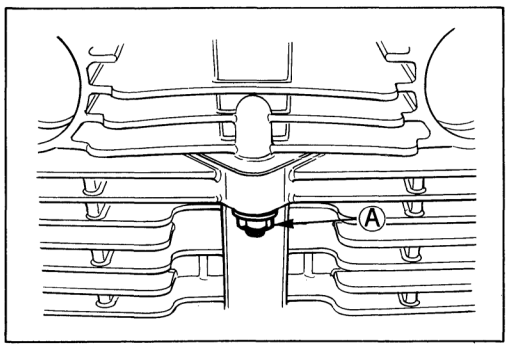
- Place the cylinder head on the cylinder.
- Tighten the eight 10-mm nuts to the specified torque with a torque wrench sequentially in the ascending order of numbers.

Cylinder head nut : 35 — 40 N·m
(3.5 — 4.0 kg-m, 25.5 — 29.0 lb-ft)



- After firmly tightening the eight 8-mm nuts, install one 6-mm nut Ⓐ and tighten it to the specified torque.

Cylinder head nut : 8 — 12 N·m
(0.8 — 1.2 kg-m, 6.0 — 8.5 lb-ft)

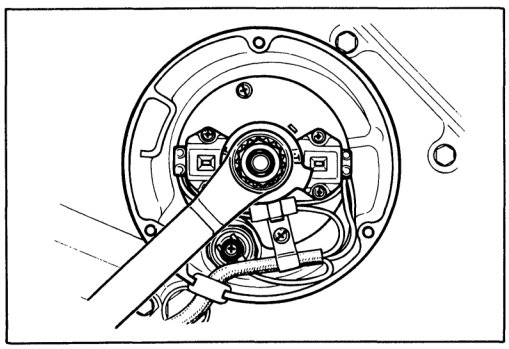


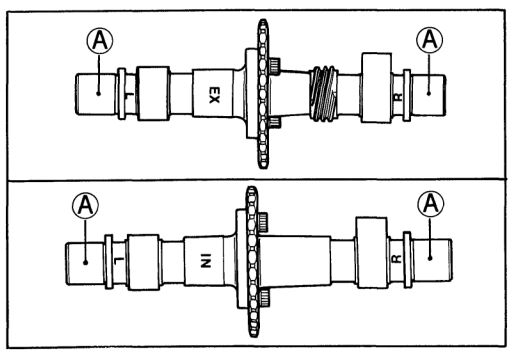
- While holding down the cam chain, rotate the crankshaft in normal direction to bring the "R"."T" mark on the rotor to the center of left pick-up coil.

CAUTION:
To turn over crankshaft, torque the nut with a 19 mm wrench. Never try to rotate the crankshaft by putting a 10 mm wrench.

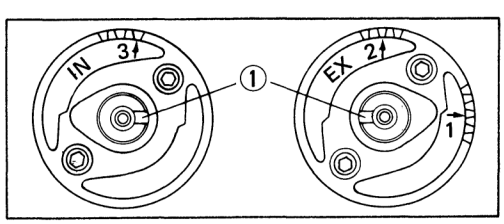
NOTE:
* *Just before placing the camshaft on the cylinder head, apply SUZUKI MOLY PASTE to its journals, fully coating each journal Ⓐ with the paste taking care not to leave any dry spot.*
* *Apply engine oil to the camshaft journal holders.*

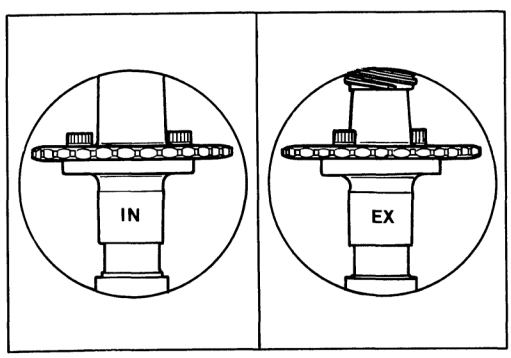
99000-25140 : SUZUKI MOLY PASTE



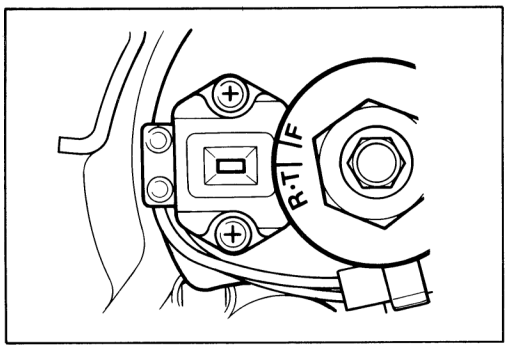


- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch ① at the right end.

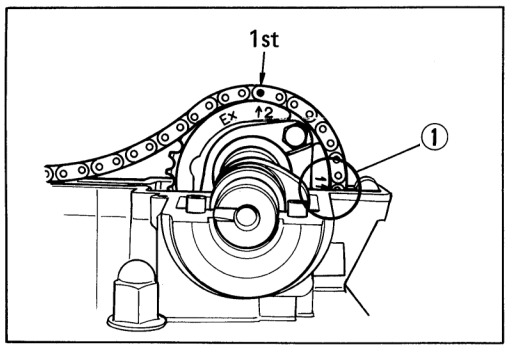




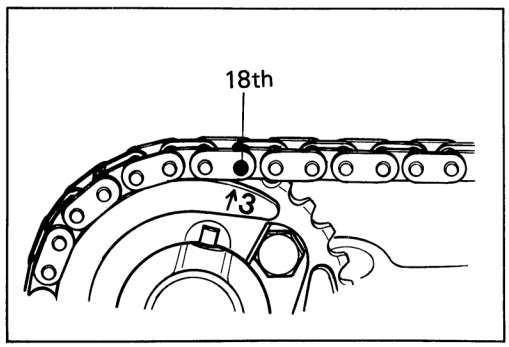
- With "R"."T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.



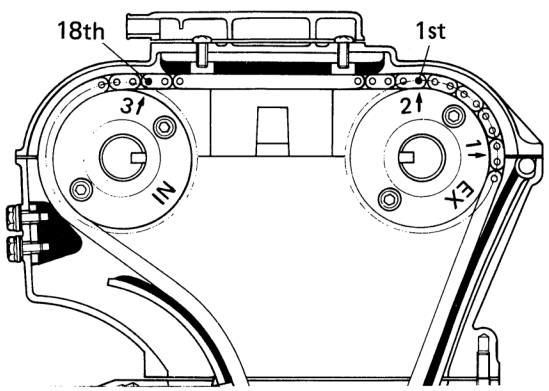
- Exhaust sprocket bears an arrow marked "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the cam chain with this sprocket.



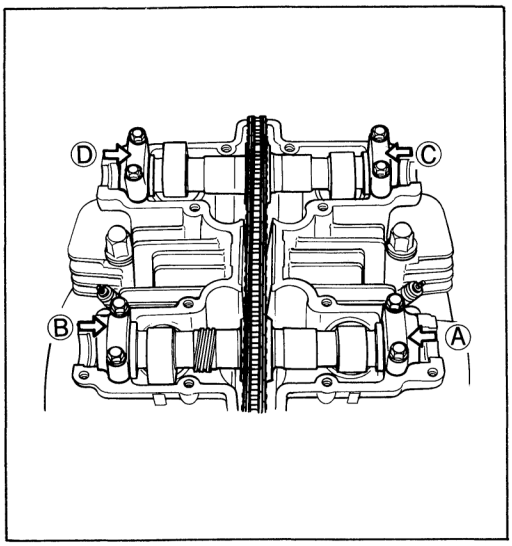
- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 18th roller pin. Engage the cam chain with intake sprocket, locating the 18th pin at the above the arrow marked "3" on the intake sprocket.



NOTE:
The cam chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the four camshaft journal holders and cam chain tensioner are secured.



- Each camshaft journal holder is identified with a cast-on letter. Install the dowel pins to each camshaft journal holder.
- Secure the four camshaft journal holders evenly by tightening the camshaft journal holder bolts sequentially. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft journal holder to another, to push shafts down evenly.



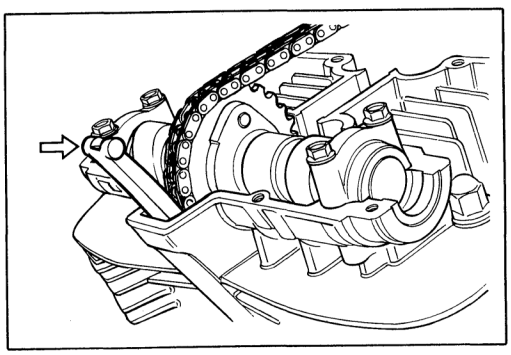
NOTE:
Damage of head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.

- Tighten the camshaft journal holder bolts to the specified torque.

Camshaft journal holder bolt : 8 — 12 N·m (0.8 — 1.2 kg-m, 6.0 — 8.5 lb-ft)

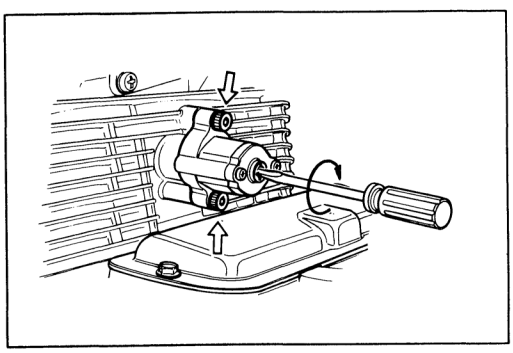
CAUTION:
The camshaft journal holder bolts are made of a special material and much superior in strength compared with other type of high strength bolts.
Take special care not to use other types of bolts instead of these special bolts. To identify these bolts, each of them has a figure "11" on its head.

- Insert the cam chain guide properly.

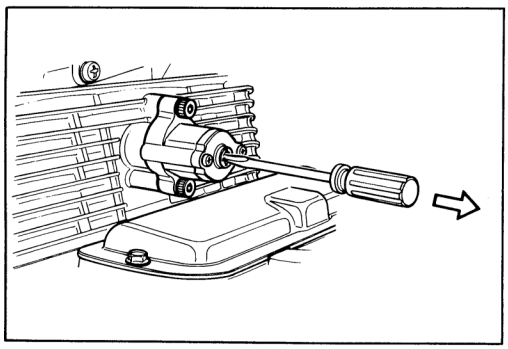


- Remove the cap and turn the slotted end of cam chain tensioner with the ⊖ screwdriver in the clockwise direction and lessen the tension from it.
- Install a new gasket and cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

Cam chain tensioner mounting bolt : 6 — 8 N·m (0.6 — 0.8 kg-m, 4.5 — 6.0 lb-ft)



- Pull out the ⊖ screwdriver from the cam chain tensioner. As the slotted end of cam chain tensioner turns, the tension rod is advanced under spring force and pushes the cam chain tensioner against the cam chain.
- Fit the cap.



CAUTION:
After installing the cam chain tensioner, check to be sure that the tensioner work properly by checking the slack of cam chain.

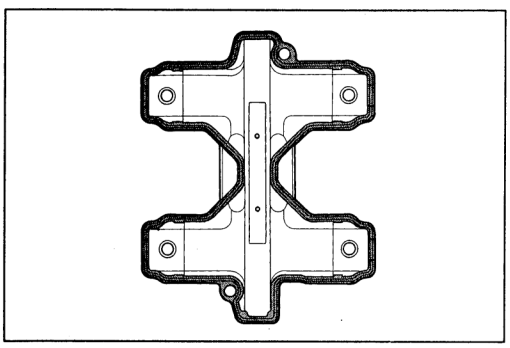
- Install the oil filter and its cap. (Refer to page 2-10.)
- Pour about 50 ml (1.69 US oz) of engine oil in each oil pocket in the head.

CAUTION:
Be sure to check and adjust the tappet clearance.
(Refer to page 2-5.)

- After adjusting the tappet clearance, install the signal generator cover.

NOTE:
Turn the crankshaft and check that all the moving parts such as cam follower, camshaft, work properly.

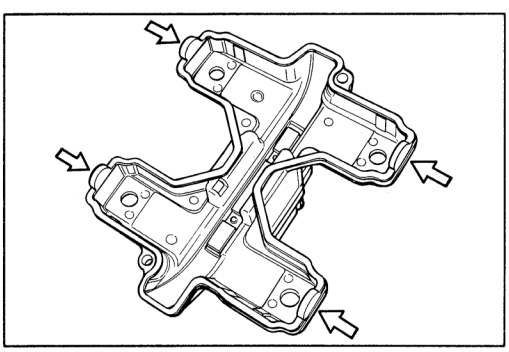
- Before installing the cylinder head cover gaskets on the cylinder head cover, apply SUZUKI BOND NO. 1207B to the groove of the head cover as shown in the figure.



(For U.S.A. model)
99104-31140 : SUZUKI BOND NO.1207B

(For the other models)
99000-31140 : SUZUKI BOND NO.1207B

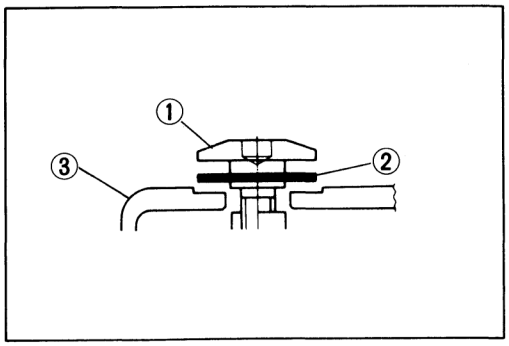
- Apply SUZUKI BOND NO.1207B to the four cam end caps of the cylinder head cover gasket as shown in the figure.



(For U.S.A. model)
99104-31140 : SUZUKI BOND NO.1207B

(For the other models)
99000-31140 : SUZUKI BOND NO.1207B

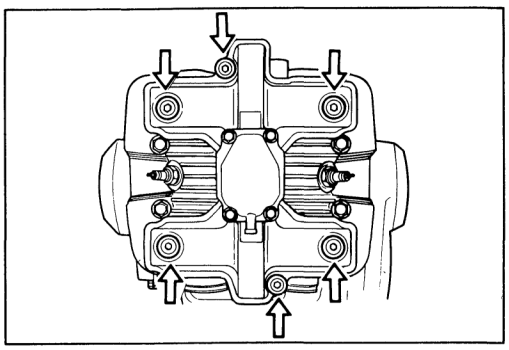
- Place the cylinder head cover on the cylinder head.
- Seat the four O-rings to each exact position.



CAUTION:
Replace the O-rings with new ones to prevent oil leakage.

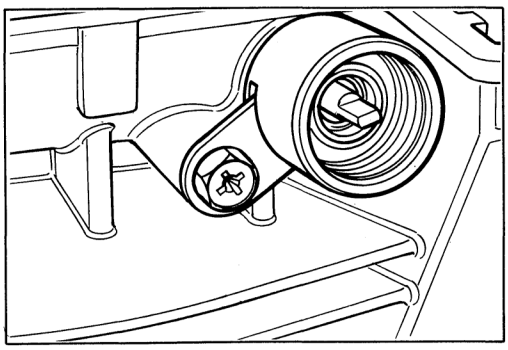
①: Cylinder head cover bolt
②: O-ring
③: Cylinder head cover

- Tighten the cylinder head cover bolts to the specified torque.

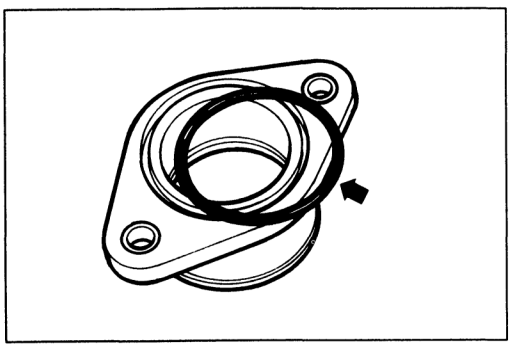


Head cover bolt : 13 – 15 N·m
(1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)

- Apply engine oil to the tachometer driven gear and install it.



CAUTION:
Use a new O-ring to prevent sucking air from the joint.



FUEL AND LUBRICATION SYSTEM

4

CONTENTS

FUEL TANK AND FUEL COCK 4- 1
FUEL TANK REMOVAL 4- 1
FUEL COCK REMOVAL 4- 1
INSPECTION AND CLEANING 4- 1
CARBURETOR 4- 2
CONSTRUCTION 4- 2
SPECIFICATIONS 4- 3
I.D.NO. LOCATION 4- 4
DIAPHRAGM AND PISTON OPERATION 4- 5
SLOW SYSTEM 4- 6
MAIN SYSTEM 4- 7
STARTER SYSTEM 4- 8
FLOAT SYSTEM 4- 8
FUEL SYSTEM 4- 9
REMOVAL 4-10
DISASSEMBLY 4-10
INSPECTION AND ADJUSTMENT 4-10
NEEDLE VALVE INSPECTION 4-10
FLOAT HEIGHT ADJUSTMENT 4-10
REASSEMBLY AND REMOUNTING 4-10
BALANCE OF CARBURETORS 4-11
LUBRICATION SYSTEM 4-13
OIL PRESSURE 4-13
OIL FILTER 4-13
OIL SUMP FILTER 4-13
ENGINE LUBRICATION SYSTEM CHART 4-14
ENGINE LUBRICATION SYSTEM 4-15

FUEL TANK AND FUEL COCK

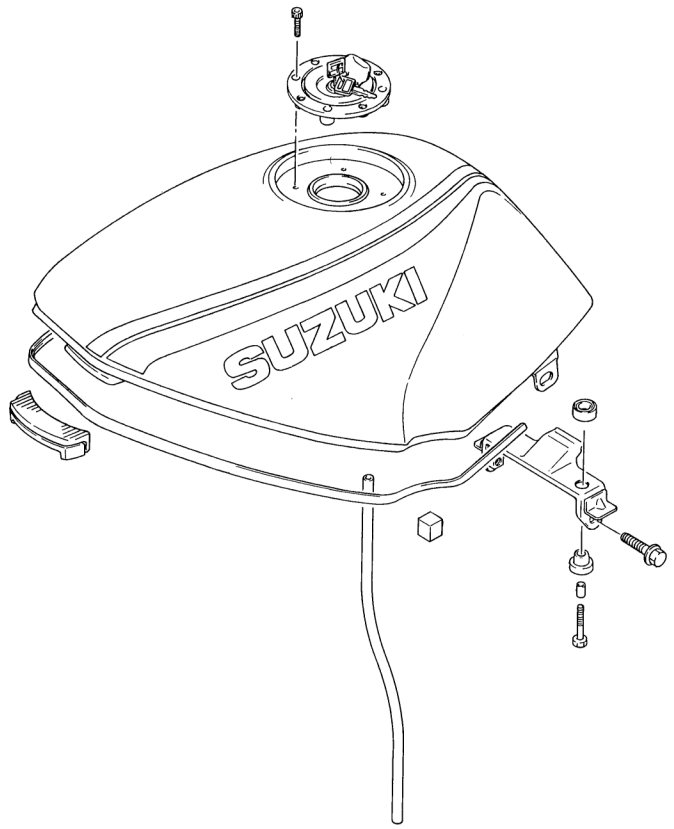
FUEL TANK REMOVAL

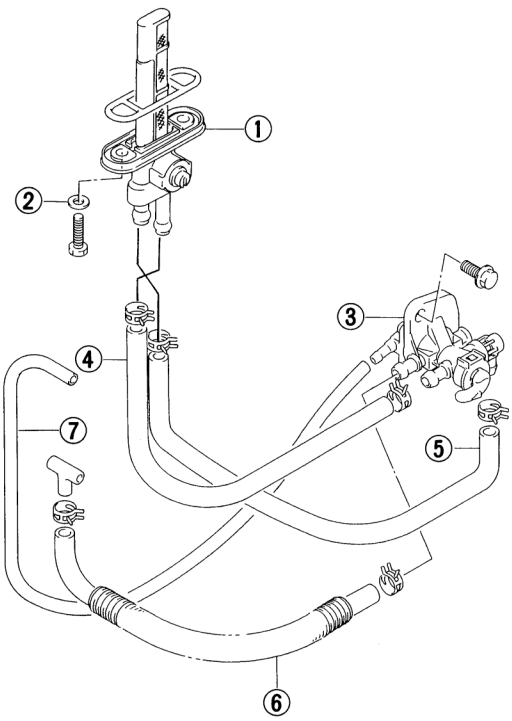
Refer to page 3-4.

FUEL COCK REMOVAL

Refer to page 3-4.

WARNING:
Gasoline is very explosive. Extreme care must be taken. Gasket must be replaced with a new one to prevent fuel leakage.

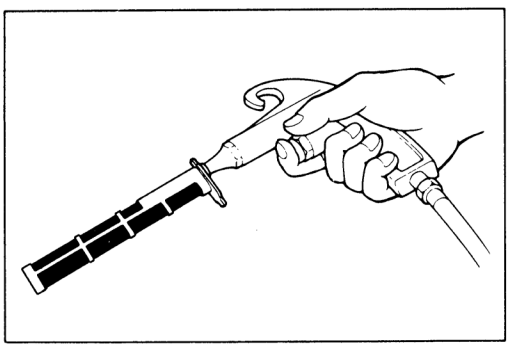




① Fuel cock No.1
② Gasket
③ Fuel cock No.2
④ Fuel hose "ON"
⑤ Fuel hose "RES"
⑥ Fuel hose
⑦ Vacuum hose

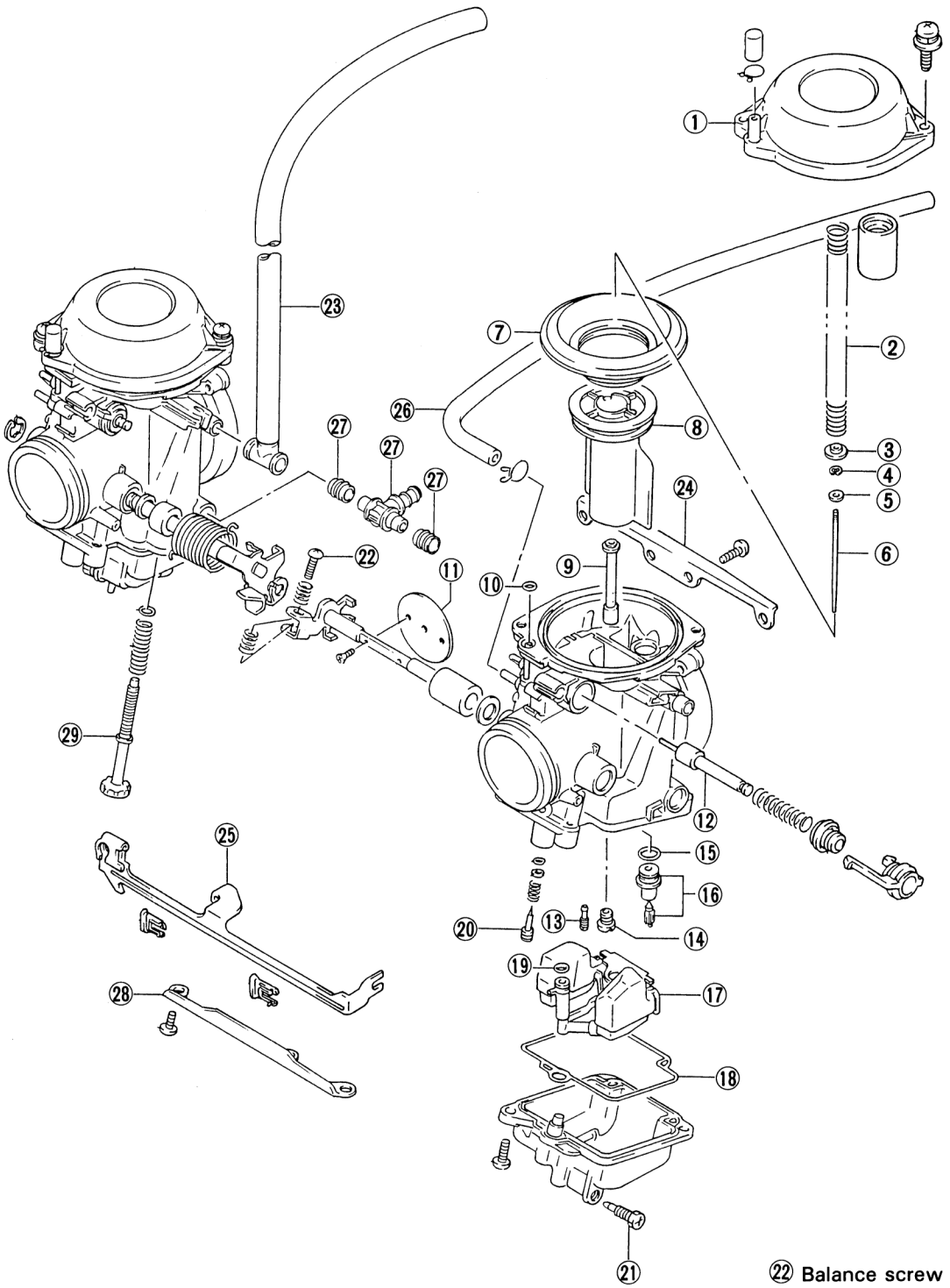
INSPECTION AND CLEANING

If the fuel strainer is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel strainer with compressed air.



CARBURETOR

CONSTRUCTION



① Top cap
② Spring
③ Spring seat
④ E-ring
⑤ Washer
⑥ Jet needle
⑦ Diaphragm
⑧ Piston valve
⑨ Needle jet
⑩ O-ring
⑪ Throttle valve
⑫ Starter plunger
⑬ Pilot jet
⑭ Main jet
⑮ O-ring
⑯ Needle valve
⑰ Float ass'y
⑱ Gasket
⑲ O-ring
⑳ Pilot screw
㉑ Drain screw
㉒ Balance screw
㉓ Air vent hose
㉔ Carburetor set upper plate
㉕ Starter shaft lever
㉖ Vacuum hose
㉗ Fuel hose connector set
㉘ Carburetor set lower plate
㉙ Throttle stop screw

SPECIFICATIONS

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33S	←
Bore size		33 mm	←
I.D. No.		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	# 37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Pilot air jet	(P.A.J.)	1.3 mm	1.35 mm
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←

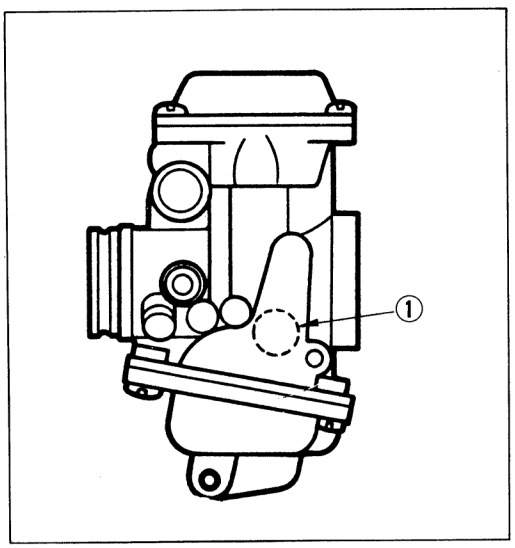
ITEM		SPECIFICATION					
		E-01, 16 17, 28	E-02, 04, 15, 21, 25, 34, 53	E-24	E-22	E-22 (GS500E-U)	E-39
Carburetor type		MIKUNI BST33SS	←	←	←	←	←
Bore size		33 mm	←	←	←	←	←
I.D. No.		01D20	01D30	01D50	01D70	01D60	01D80
Idle r/min.		1 200 ± 100 r/min	←	←	←	←	←
Float height		14.6 ± 1.0 mm	←	←	←	←	←
Main jet	(M.J.)	#122.5	#120	←	←	#135	#120
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	5DH9-4th	5DH9-3rd
Needle jet	(N.J.)	O–2	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←

ITEM		SPECIFICATION					
		E-01, 16 17, 28	E-02, 04, 15, 21, 25, 34, 53	E-24	E-22	E-22 (GS500E-U)	E-39
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2-1/4 turns back)	←	←	←	←	←
Pilot air jet	(P.A.J.)	1.3 mm	←	←	←	←	←
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←	←	←	←	←

E-01: General
E-02: England
E-03: U.S.A.
E-04: France
E-15: Finland
E-16: Norway
E-17: Sweden
E-21: Belgium
E-22: W. Germany
E-24: Australia
E-25: Netherland
E-28: Canada
E-33: California (U.S.A.)
E-34: Italy
E-39: Austria
E-53: Spain

I.D. NO. LOCATION

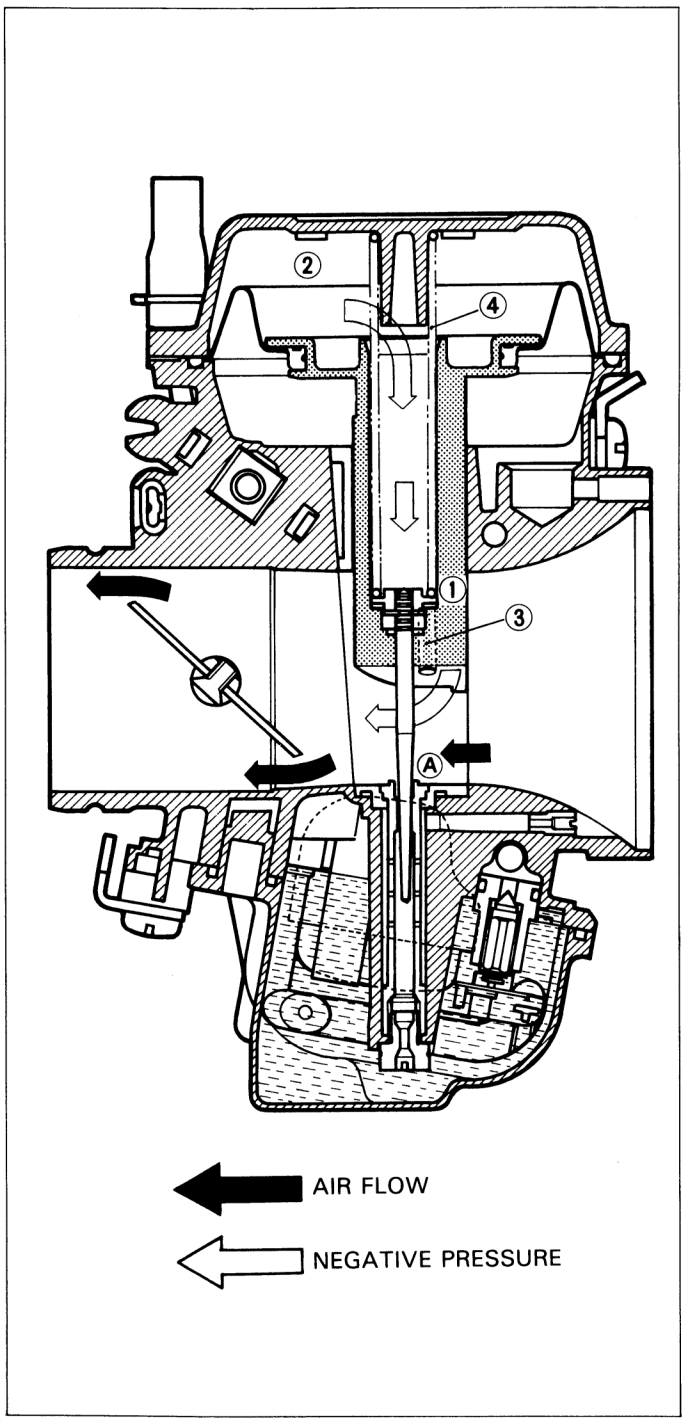
Each carburetor has I.D. Number ① printed on the carburetor body according to its specification.

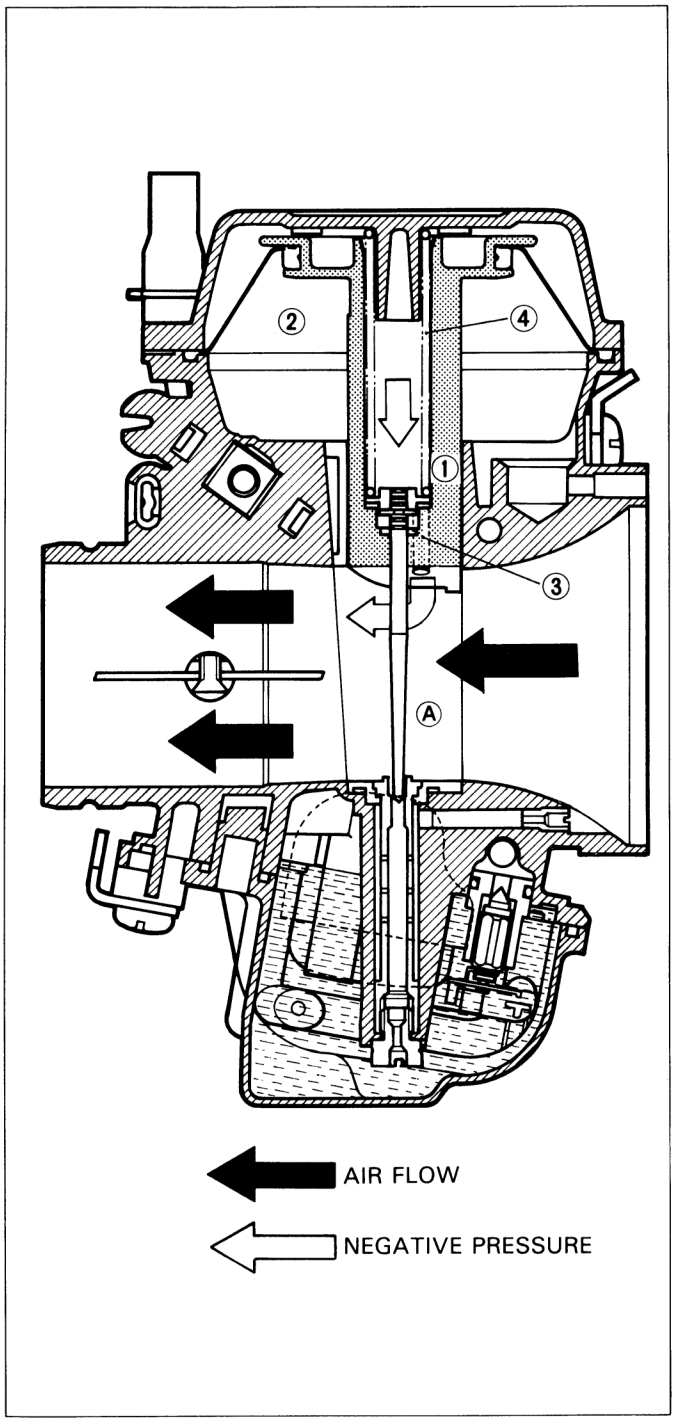


DIAPHRAGM AND PISTON OPERATION

The carburetor is a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston valve ① which moves according to the negative pressure present on the downstream side of the venturi Ⓐ. Negative pressure is admitted into the diaphragm chamber ② through two orifices ③ provided in the piston valve ①.

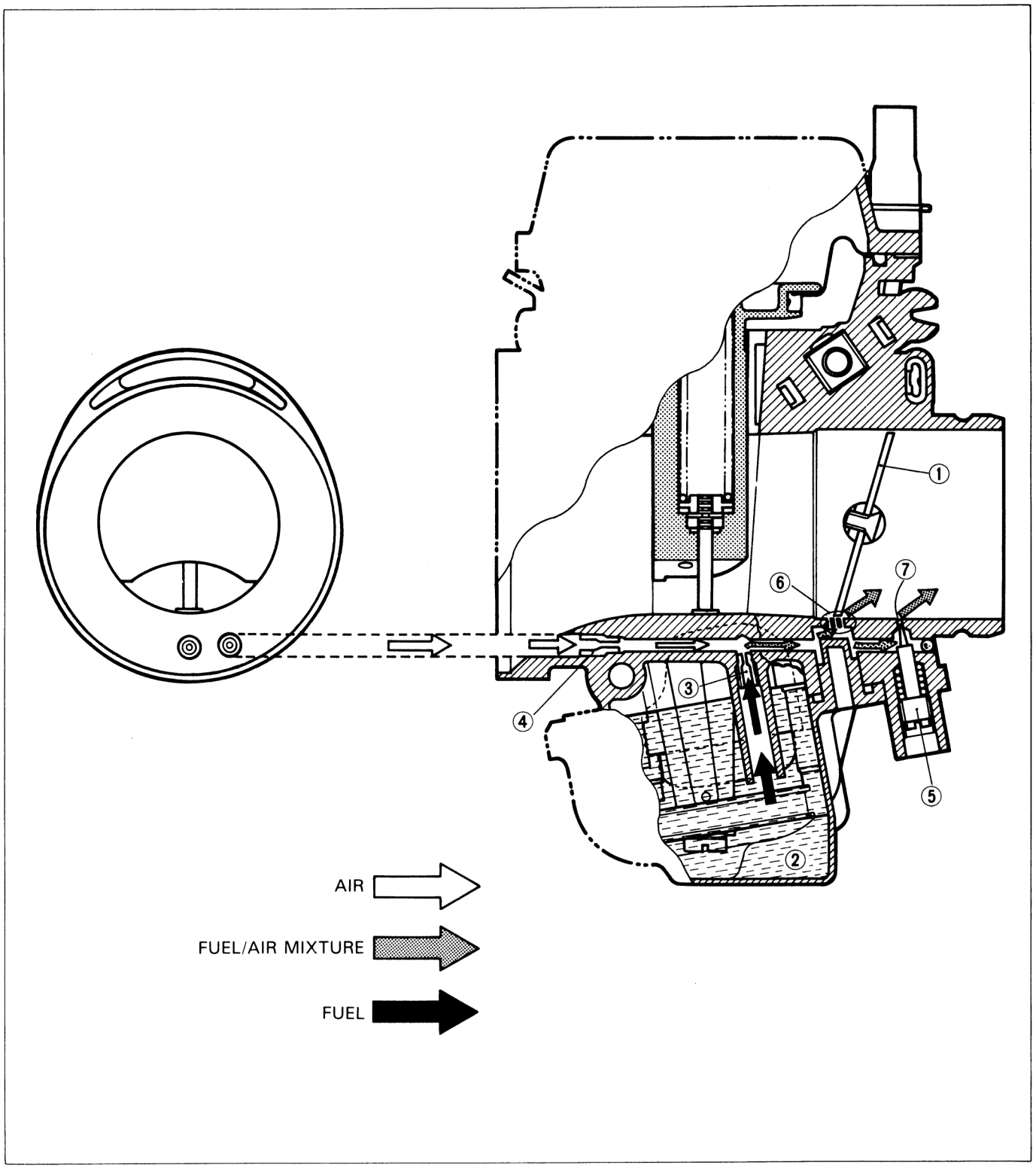
Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing optimum ratio of fuel/air mixture.





SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve ① closed or slight opened. The fuel from float chamber ② is metered by pilot jet ③ where it mixes with air coming in through pilot air jet ④. This mixture, rich with fuel, then goes up through pilot passage to pilot screw ⑤. A part of the mixture is discharged into the main bore out of bypass ports ⑥. The remainder is then metered by pilot screw ⑤ and sprayed out into the main bore through pilot outlet ⑦.



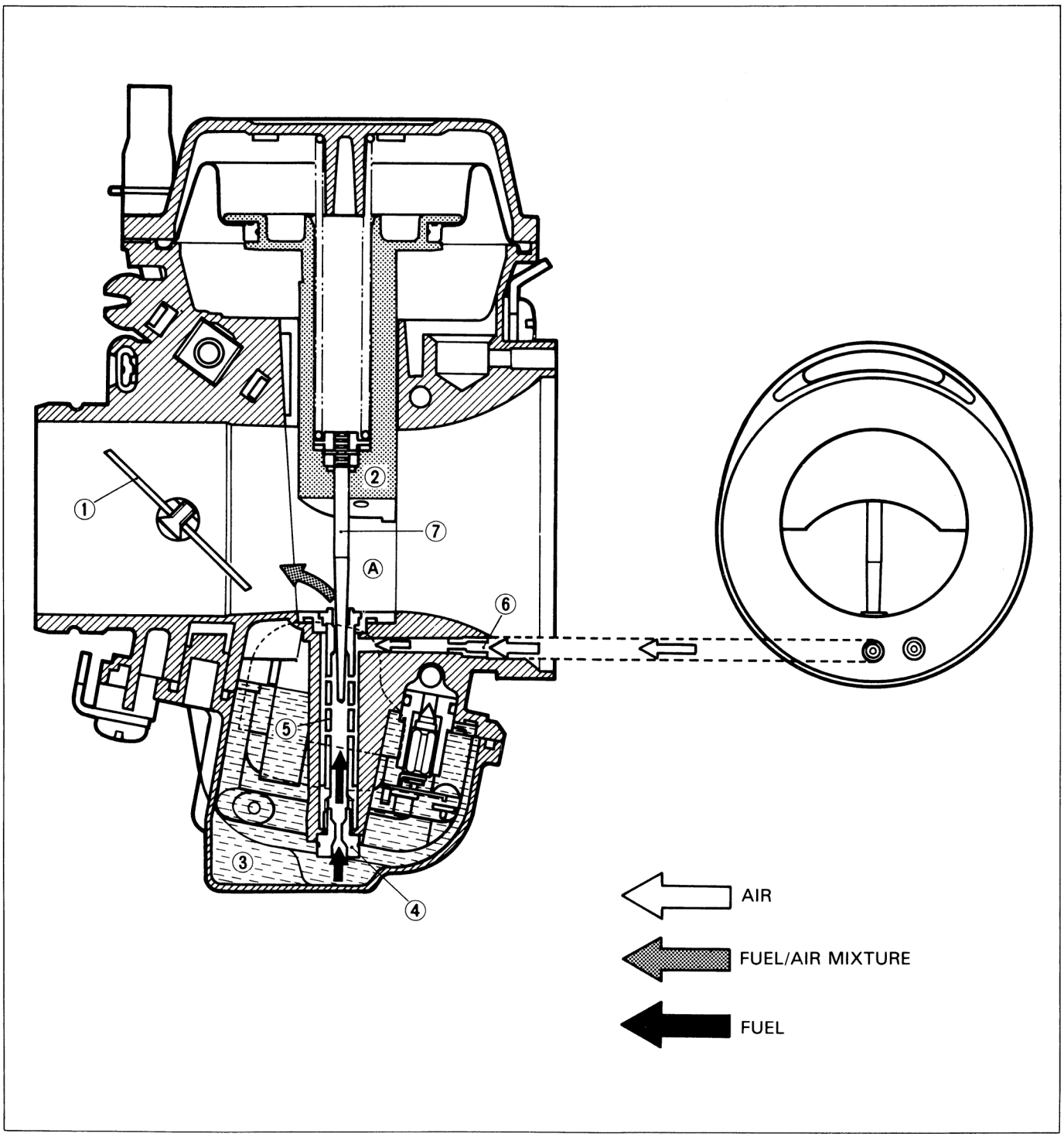
MAIN SYSTEM

As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi Ⓐ. Consequently the piston valve ② moves upward.

Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion.

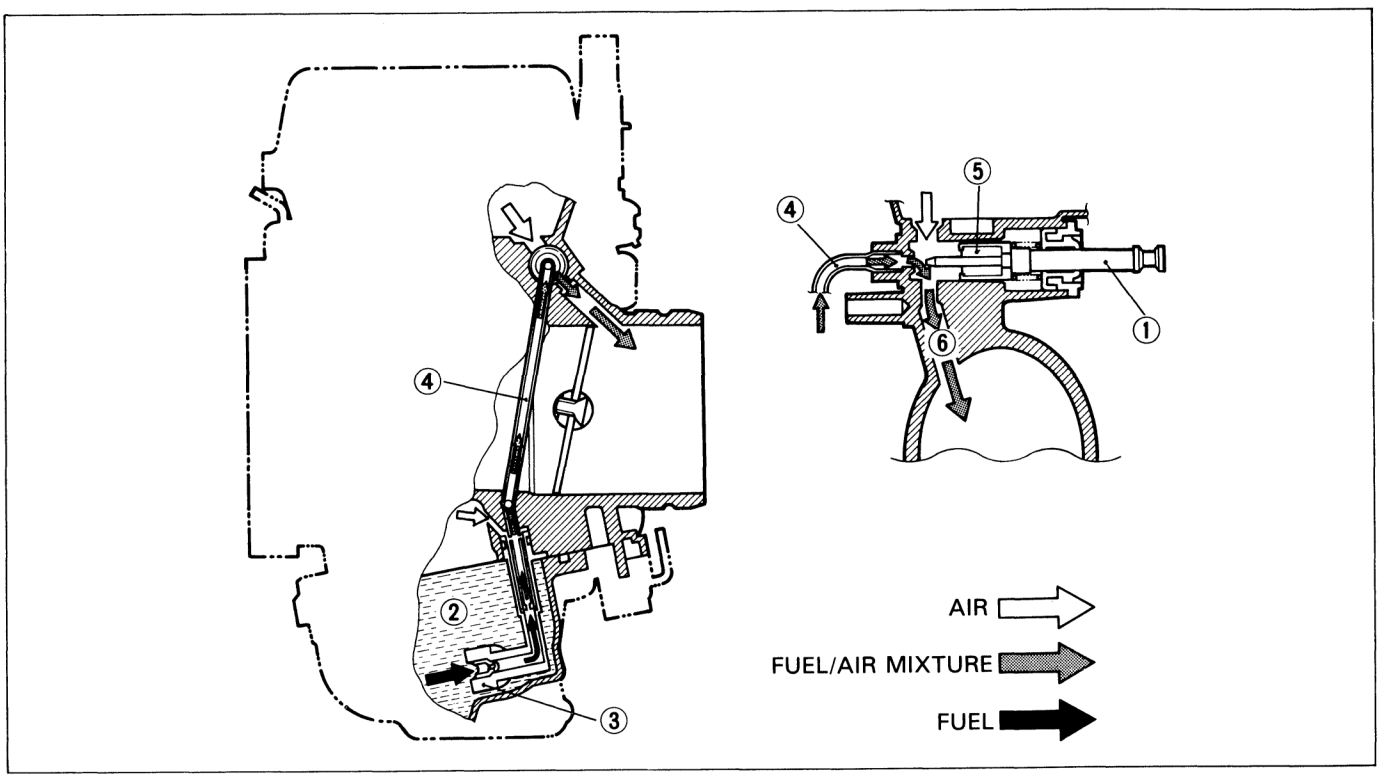
The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi Ⓐ, in which it meets main air stream being drawn by the engine.

Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.



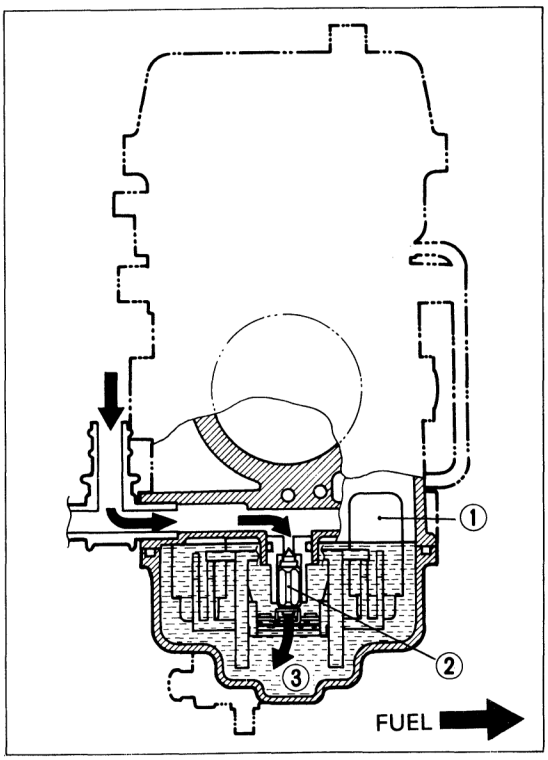
STARTER SYSTEM

Pulling up the starter shaft ①, fuel is drawn into the starter circuit from the float chamber ②. Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with the air coming through a passage extending from behind the diaphragm.
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet ⑥ into the main bore.



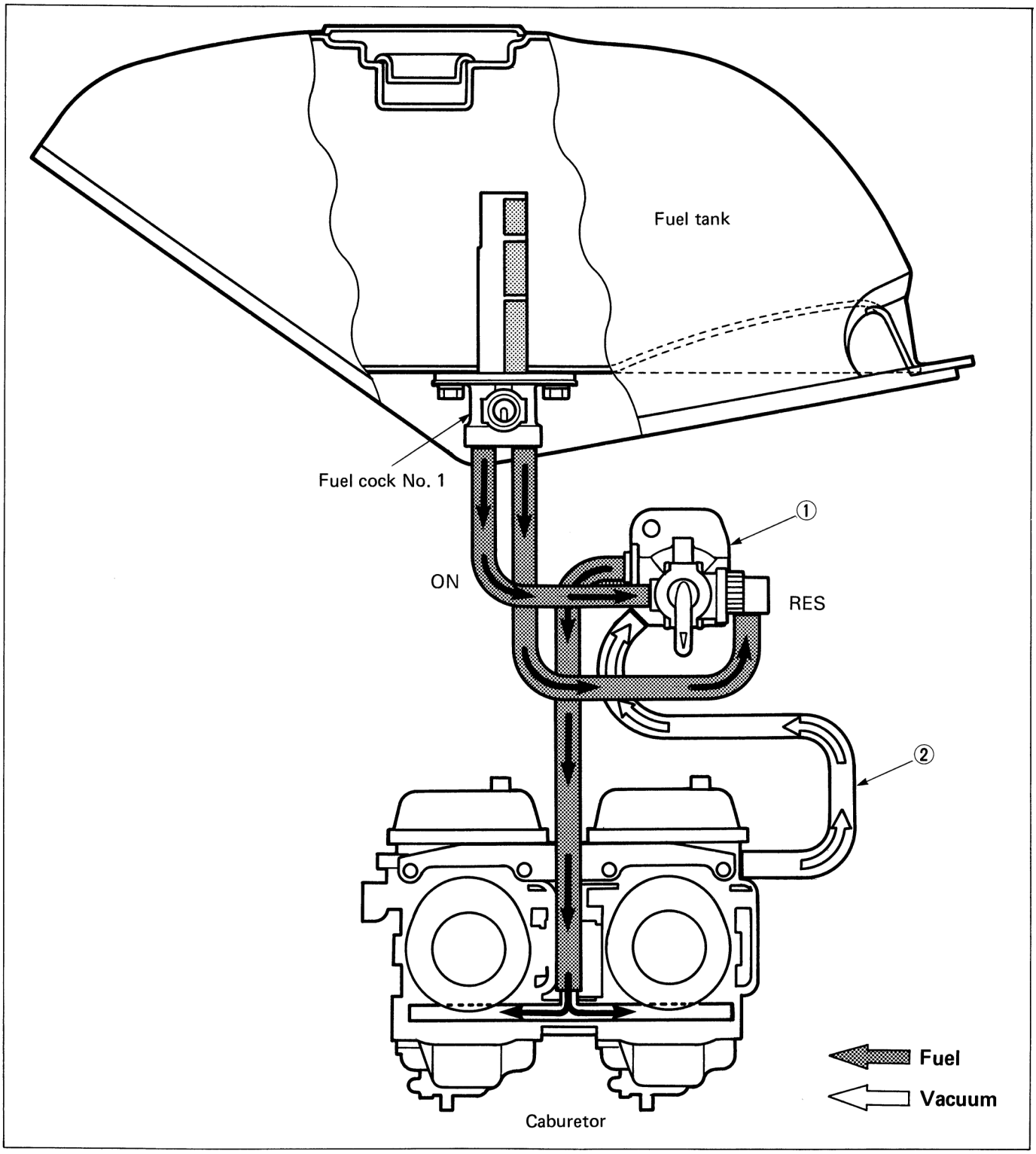
FLOAT SYSTEM

Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.
When fuel level is up in float chamber ③, floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber ③. As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③.
In this manner, needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③.



FUEL SYSTEM

When turning starter motor, negative pressure is generated in the combustion chamber. This negative pressure works on the diaphragm of fuel cock ① through passage way provided in the carburetor main bore and vacuum hose ②, and diaphragm builds up a negative pressure which is higher than the spring pressure. Fuel valve in the fuel cock ① is forced to open due to diaphragm operation, and thus allows fuel to flow into carburetor float chamber.



REMOVAL

Refer to page 3-5.

DISASSEMBLY

Disassemble the carburetor as shown in the illustration on page 4-2.

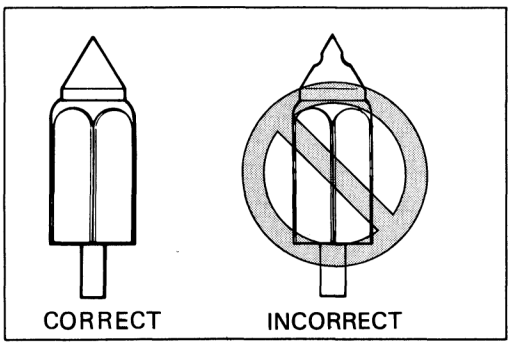
INSPECTION AND ADJUSTMENT

Check following items for any damage or clogging.

* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet air bleeding hole
* Float
* Needle valve
* Starter jet
* Gasket and O-ring
* Throttle shaft oil seal
* Diaphragm
* Pilot outlet and by-pass holes

NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle is worn as shown in the illustration, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

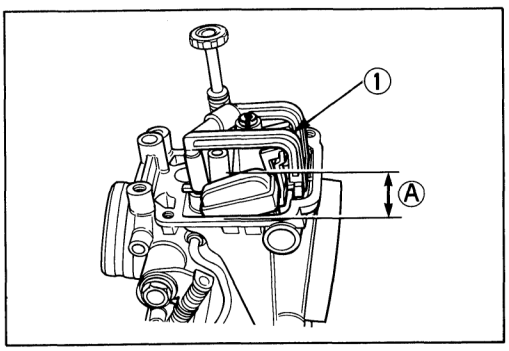


FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using calipers.
Bend the tongue ① as necessary to bring the height Ⓐ to this value.

Float height Ⓐ: 14.6 ± 1.0 mm (0.57 ± 0.04 in)

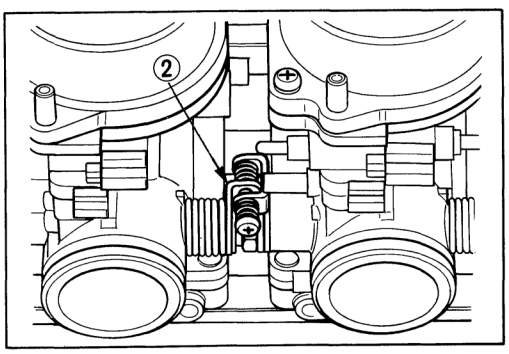
09900-20102 : Vernier calipers



REASSEMBLY AND REMOUNTING

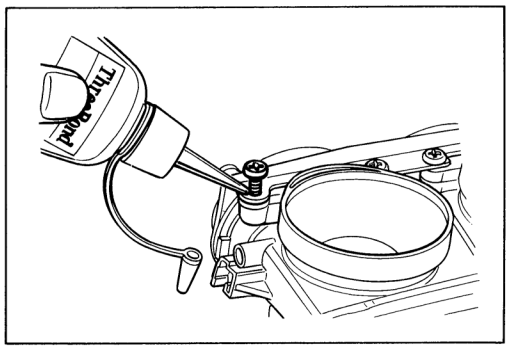
Reassemble and remount the carburetor assembly in the reverse order of disassembly and removal.
Pay attention to the following points:

- When engaging two carburetors, position the throttle valve control lever ② correctly.

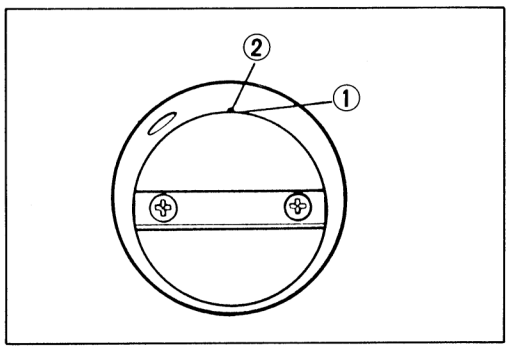


- Apply THREAD LOCK CEMENT to the upper and lower plates' screws.

99000-32040 : THREAD LOCK CEMENT



- Set each throttle valve in such a way that its top end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.
- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  * Engine idle r/min ..... Page 2-11
  * Throttle cable play ..... Page 2-11
  * Balancing carburetors ..... Page 4-12



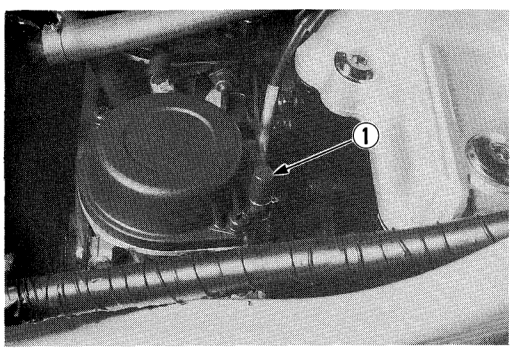
BALANCE OF CARBURETORS

Check the two carburetors for balancing movement according to the following procedures.

NOTE:
When balancing the carburetors, remove the fuel tank and fuel should be supplied by a separate fuel tank and be sure to plug the fuel cock vacuum line.

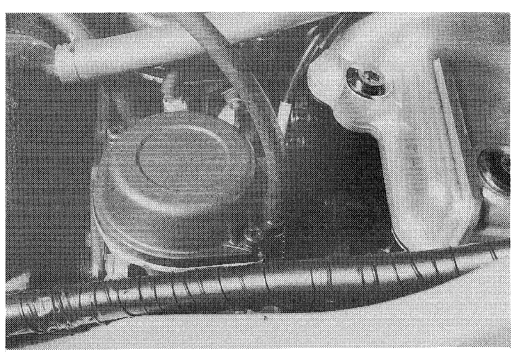
CALIBRATING EACH GAUGE

- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the vacuum inlet cap ① for right cylinder.

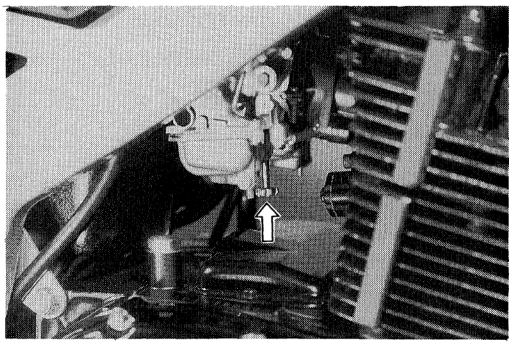


- Connect one of the four rubber hoses of balancer gauge to this inlet.

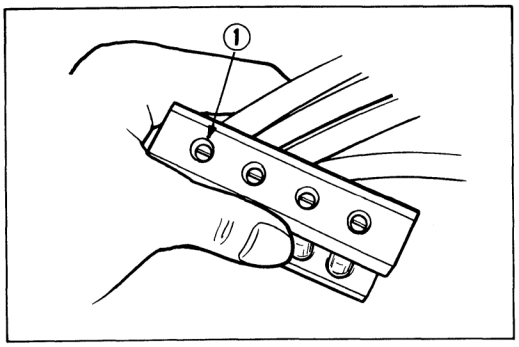
09913-13121 : Carburetor balancer

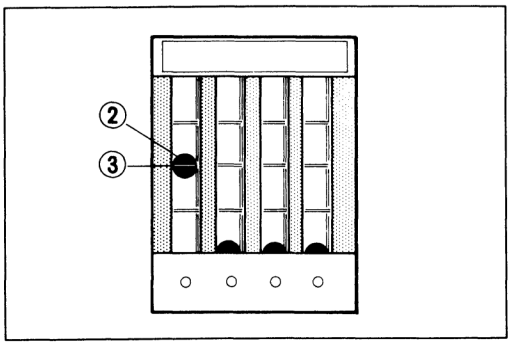


- Start up the engine and keep it running at 1 750 r/min. by turning throttle stop screw.



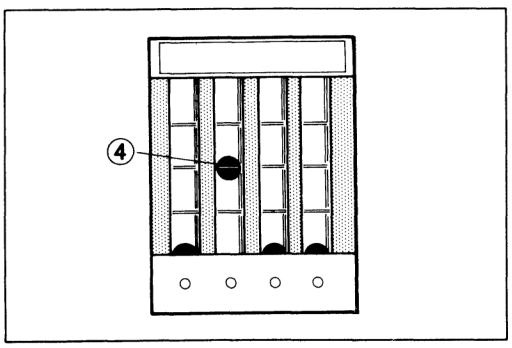
- Turn the air screw ① of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ② in the tube to the center line ③.





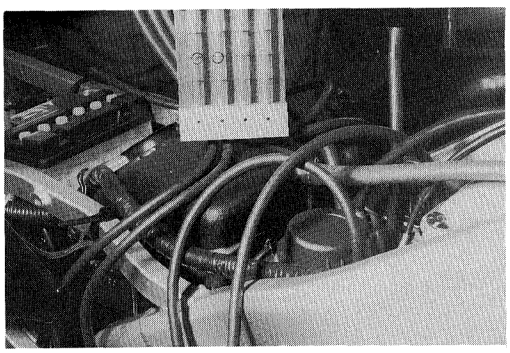
- After making sure that the steel ball stays steady at the center line, disconnect the hose from inlet and connect the next hose to the inlet.
- Turn air screw to bring the other steel ball ④ to the center line.

The balancer gauge is now ready for use in balancing the carburetors.



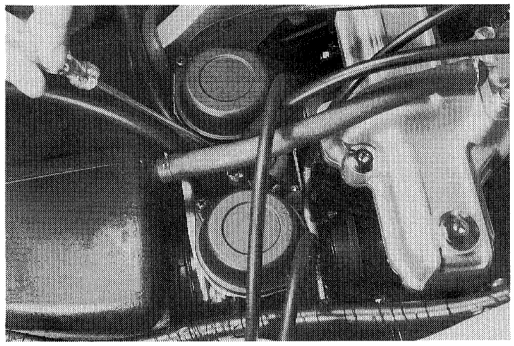
BALANCING CARBURETORS

For balancing all the carburetor movement, remove all the vacuum inlet caps from each carburetor. Connect the balancer gauge hoses to these vacuum inlets and adjust the balance of carburetors as follows:



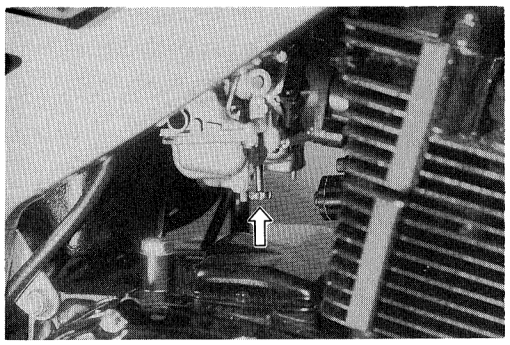
- Start up the engine, and keep it running at 1 750 r/min. to see engine tachometer reading.
  A correctly adjusted carburetor has the steel balls in the No. 1 and No. 2 tubes at the same level.

- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly.

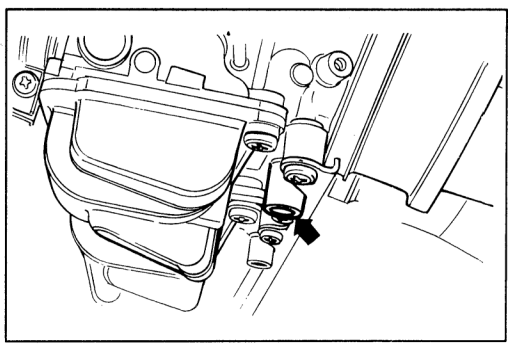


- After balancing the carburetors, set its speed between 1 100 and 1 300 r/min. by turning the throttle stop screw referring engine tachometer reading.

  Idle r/min: 1 200 ± 100 r/min



CAUTION:
Do not disturb the pilot screw. This component is PRE-SET at the factory by the very specialized equipment.



LUBRICATION SYSTEM

OIL PRESSURE

Refer to page 3-2.

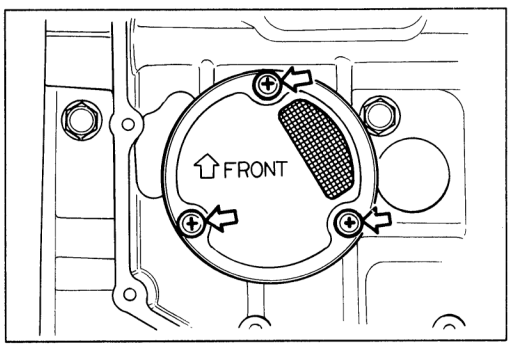
OIL FILTER

Refer to page 2-10.

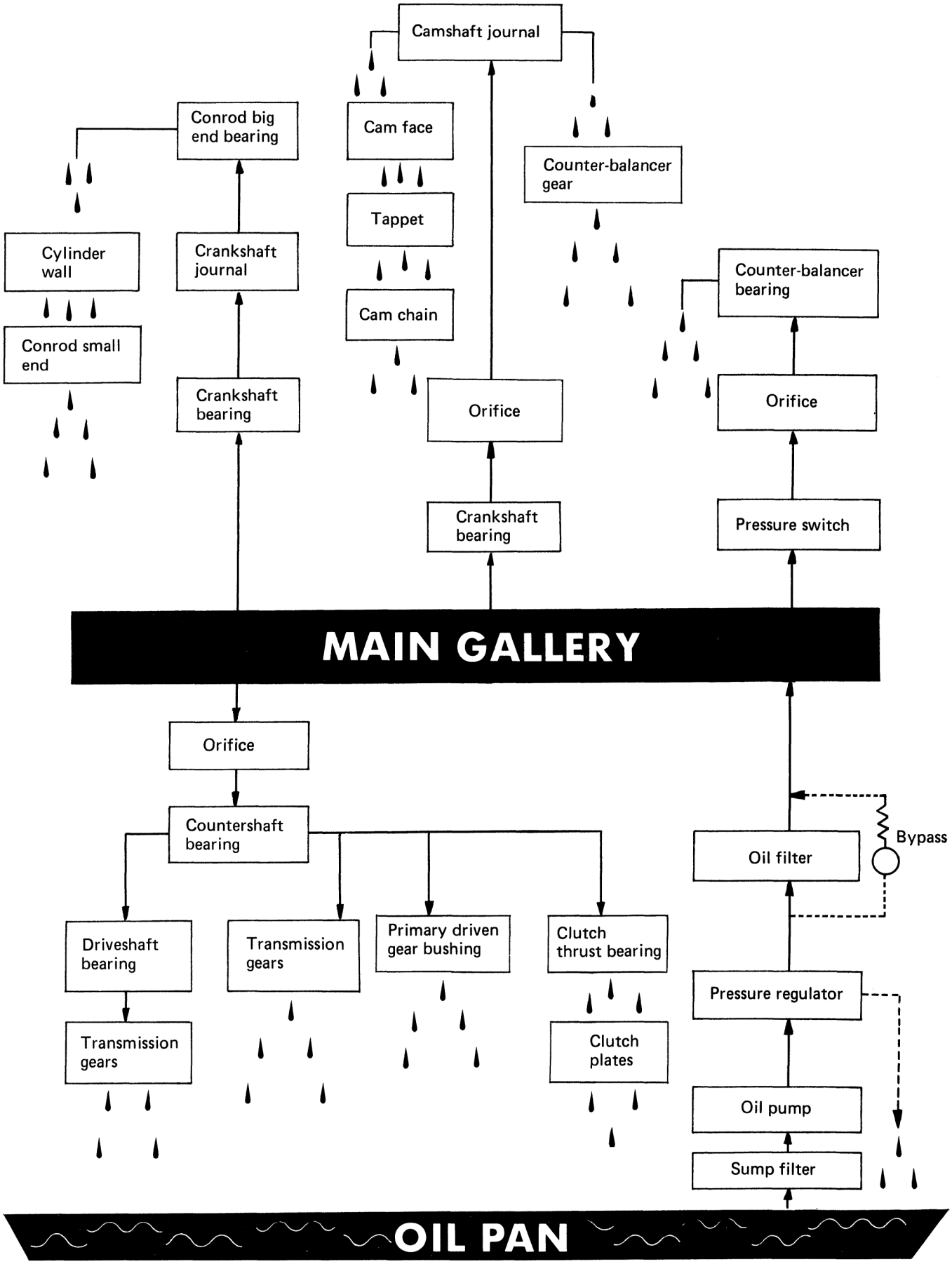
OIL SUMP FILTER

At the same time wash the oil pan. Check to be sure that the oil sump filter is free from any sign of rupture and wash the filter clean periodically.

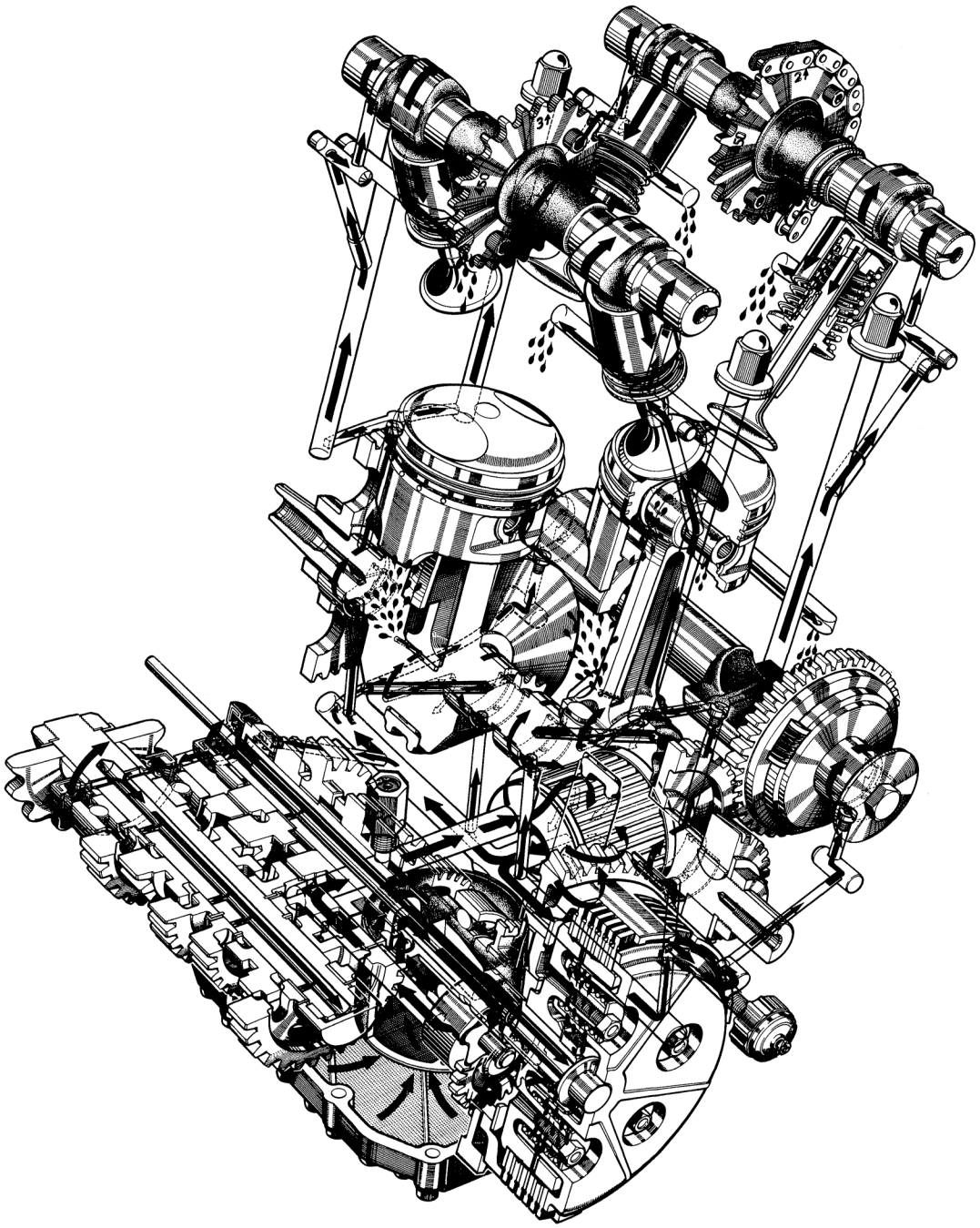
CAUTION:
Replace the oil pan gasket with new one to prevent oil leakage.



ENGINE LUBRICATION SYSTEM CHART



ENGINE LUBRICATION SYSTEM



ELECTRICAL SYSTEM

CONTENTS

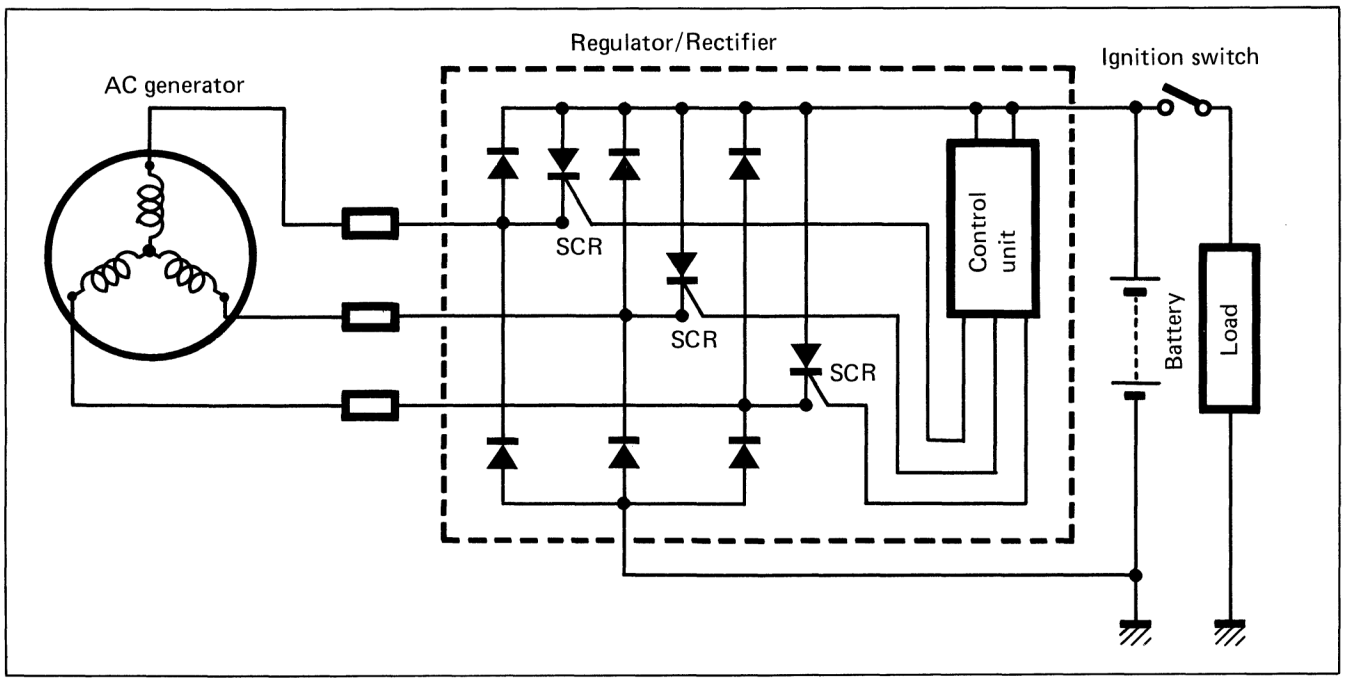
CHARGING SYSTEM 5- 1
DESCRIPTION 5- 1
INSPECTION 5- 3
IGNITION SYSTEM 5- 5
DESCRIPTION 5- 5
INSPECTION 5- 6
STARTER SYSTEM 5-10
DESCRIPTION 5-10
REMOVAL AND DISASSEMBLY 5-10
INSPECTION 5-11
REASSEMBLY 5-12
STARTER RELAY INSPECTION 5-13
SIDE-STAND/ IGNITION INTERLOCK SYSTEM 5-13
DESCRIPTION 5-13
INSPECTION 5-15
COMBINATION METER 5-16
REMOVAL AND DISASSEMBLY 5-16
INSPECTION 5-17
LAMPS 5-18
HEADLIGHT 5-18
TAIL/ BRAKE LIGHT 5-18
TURN SIGNAL LIGHT 5-19
SWITCHES 5-19
RELAY 5-20
STARTER RELAY 5-20
SIDE-STAND RELAY 5-20
TURN SIGNAL RELAY 5-20
BATTERY 5-21
SPECIFICATIONS 5-21
INITIAL CHARGING 5-21
SERVICING 5-21
RECHARGING OPERATION BASED ON S.G. READING 5-22
SERVICE LIFE 5-23

CHARGING SYSTEM

DESCRIPTION

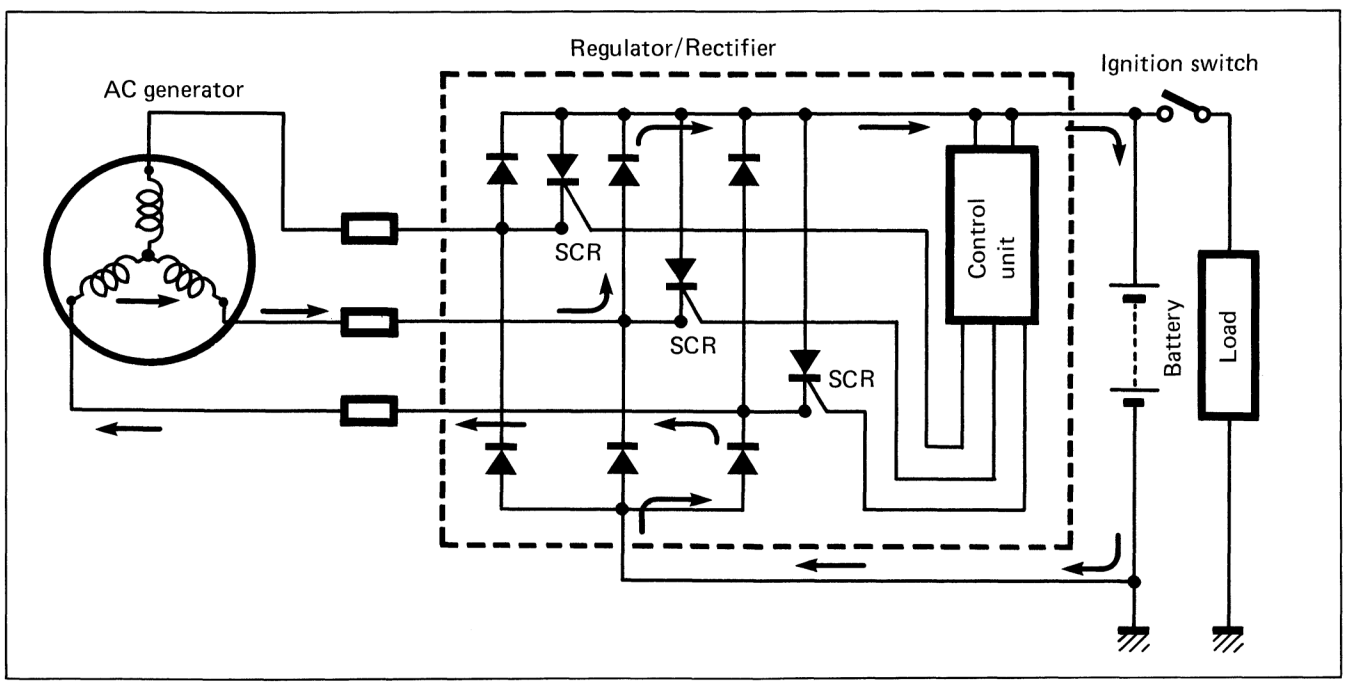
The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from the AC generator is rectified by the rectifier and is turned into DC current, then it charges the battery.

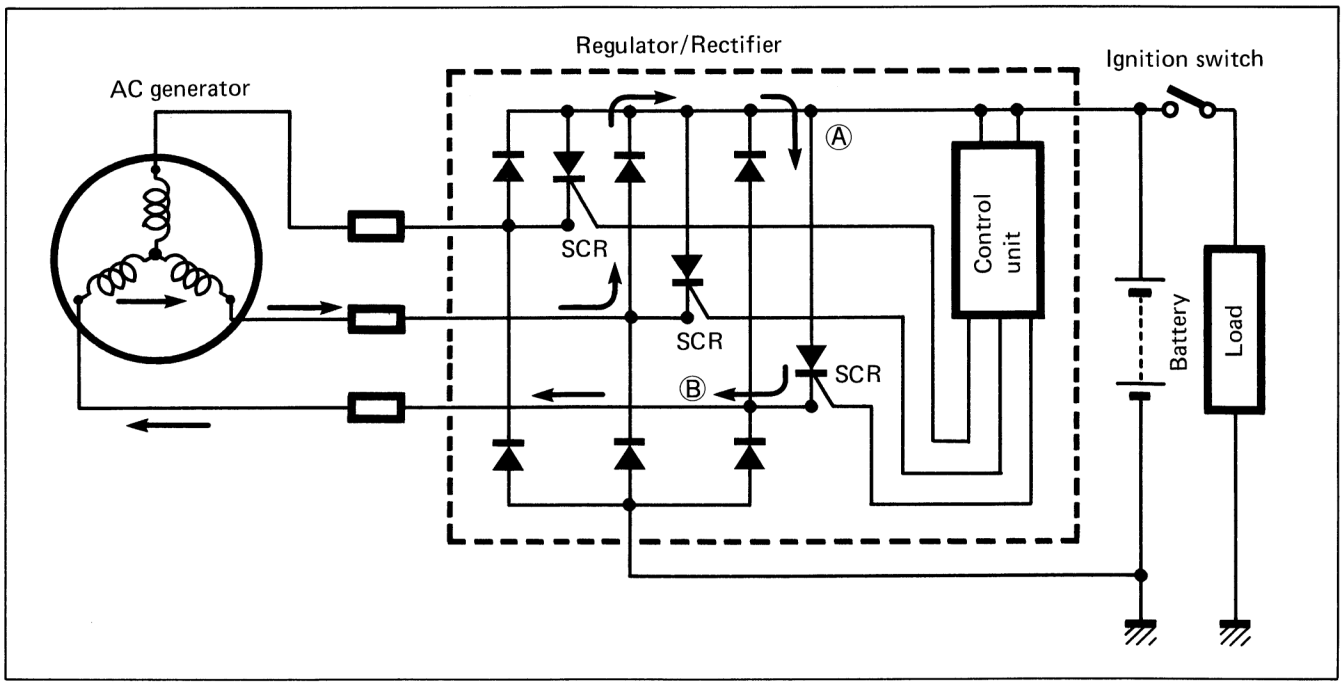


FUNCTION OF REGULATOR

While the engine r/min is low and the generated voltage of the AC generator is lower than the adjusted voltage of regulator, the regulator does not function. However, the generated current charges the battery directly at this time.

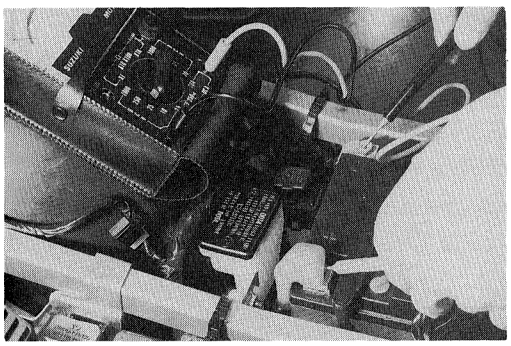


When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the control unit and it is turned "ON", a signal will be sent to the SCR (Thyristor) gate probe and the SCR will be turned "ON".
Then, the SCR becomes conductive in the direction from point Ⓐ to point Ⓑ. At this time, the current generated from the AC generator gets through the SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows to point Ⓑ , the reverse current tends to flow to SCR. Then, the circuit of SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage and current to the battery constant and protect it from overcharging.



INSPECTION

CHARGING OUTPUT CHECK

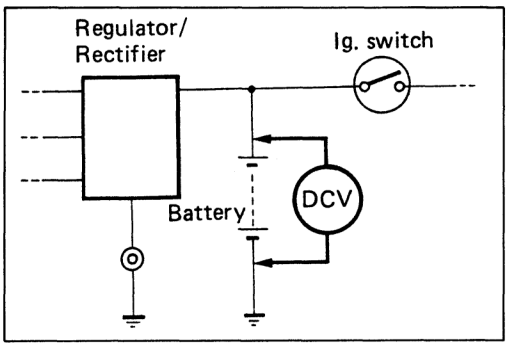


- Remove the seat.
- Start the engine and keep it running at 5 000 r/min with lighting switch turned ON and dimmer switch turned HI position.
- Using the pocket tester, measure the DC voltage between the battery terminals, ⊕ and ⊖ .
  If the tester reads under 13.5V or over 15.5V, check the AC generator no-load performance and regulator/rectifier.

NOTE:
When making this test, be sure that the battery is fully-charged condition.

STD charging output : 13.5 – 15.5V (DC) at 5 000 r/min

09900-25002 : Pocket tester

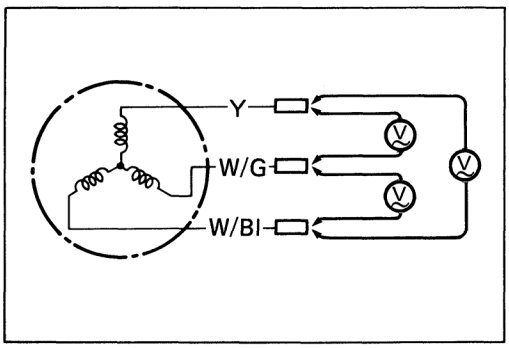


AC GENERATOR NO-LOAD PERFORMANCE

- Remove the seat and left frame cover.
- Disconnect the AC generator lead wires.
- Start the engine and keep it running at 5 000 r/min.
- Using the pocket tester, measure the AC voltage between the three lead wires.
  If the tester reads under 75V, the AC generator is faulty.

STD no-load performance : More than 75V (AC) at 5 000 r/min (When engine is cold.)

09900-25002 : Pocket tester

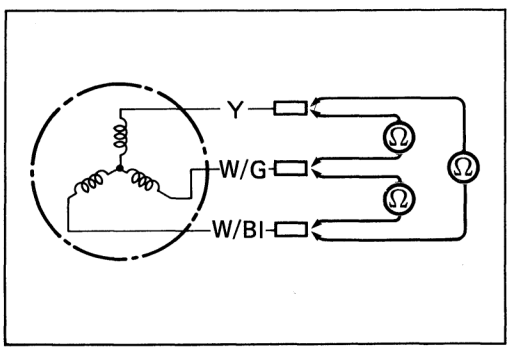


AC GENERATOR CONTINUITY CHECK

- Using the pocket tester, check the continuity between the three lead wires.
  Check that there is no continuity between the lead wires and ground.

09900-25002 : Pocket tester

NOTE:
When making above test, it is not necessary to remove the AC generator.

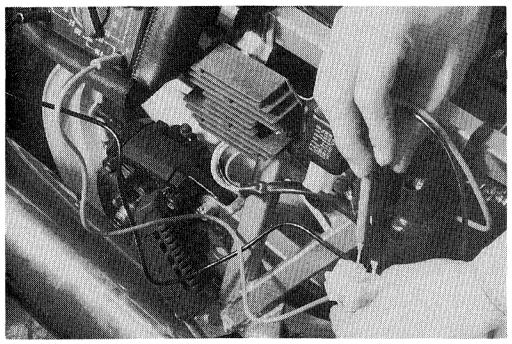


Y : Yellow
W/G : White with Green tracer
W/Bl : White with Blue tracer

REGULATOR/RECTIFIER

- Remove the seat and right frame cover.
- Using the pocket tester (x 1Ω range), measure the resistance between the lead wires in the following table.
  If the resistance checked is incorrect, replace the regulator/rectifier.

09900-25002 : Pocket tester

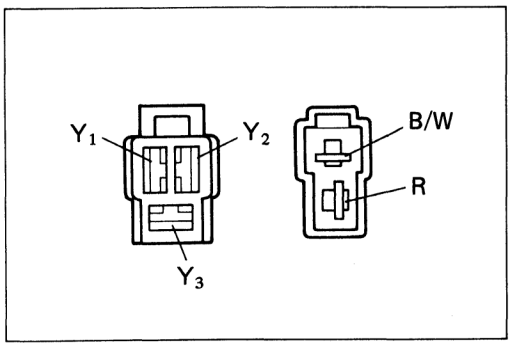


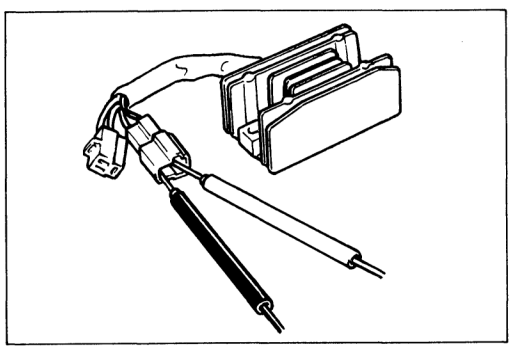
Unit: Approx. Ω

⊖ Probe of tester to:	⊕ Probe of tester to:					
		Y_1	Y_2	Y_3	R	B/W
	Y_1		∞	∞	6.0	∞
	Y_2	∞		∞	6.0	∞
	Y_3	∞	∞		6.0	∞
	R	∞	∞	∞		∞
①	B/W	6.0	6.0	6.0	40	

Y: Yellow, R: Red, B/W: Black with White tracer, ∞ : Infinity

NOTE:
As transistors, capacitors, Zener diodes, etc. are used inside this regulator/rectifier, the resistance values will differ when an ohmmeter other than the SUZUKI pocket tester is used.



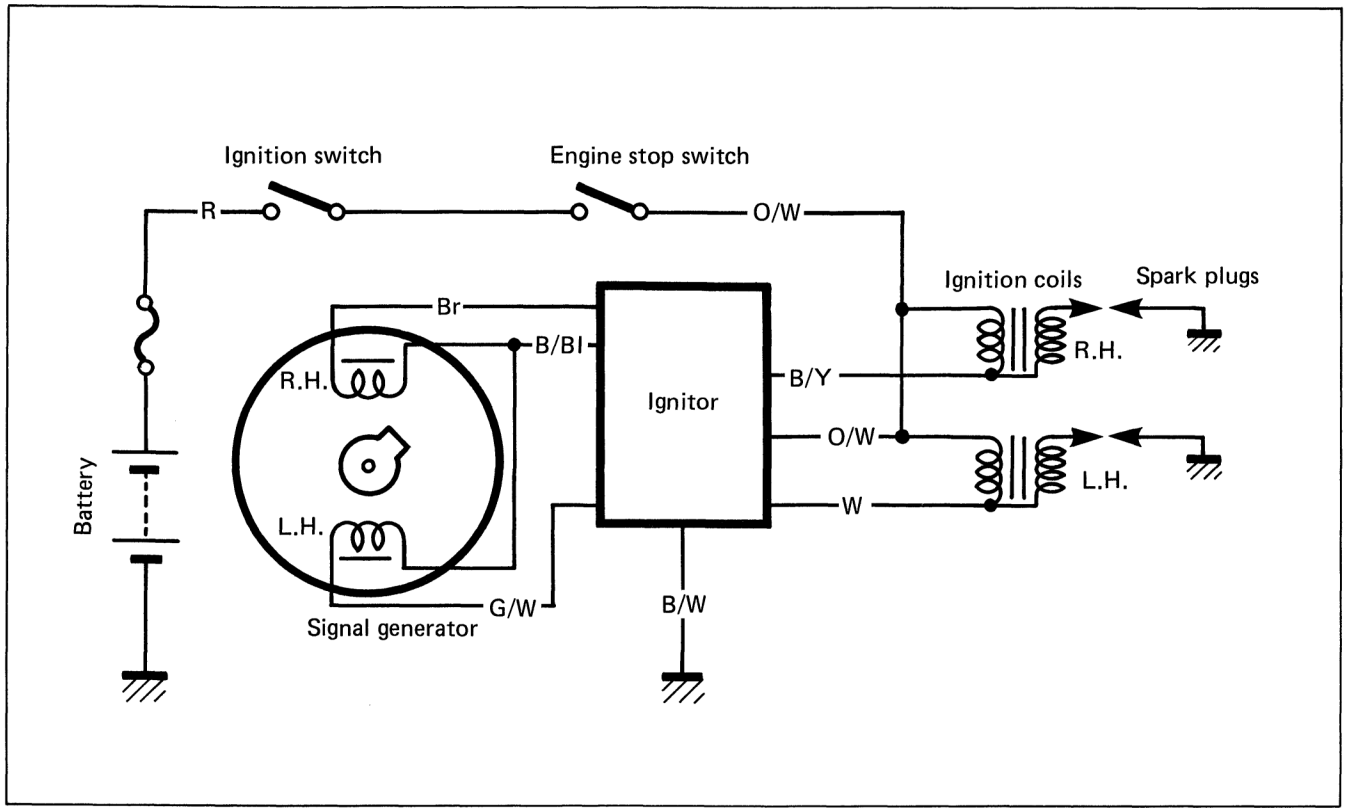


IGNITION SYSTEM

DESCRIPTION

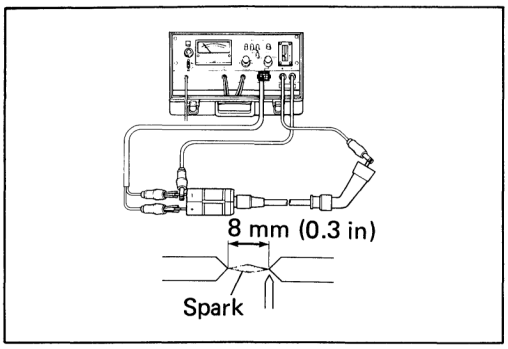
The fully transistorized ignition system consists of a signal generator, ignitor, ignition coils, and spark plugs. The signal generator comprises rotor tip and pick-up coil.

The signal generator is mounted at the right end of the crankshaft. The output of the signal generator goes to the ignitor unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary windings of the ignition coil is also turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.



NOTE:
The ignition cut-off circuit is not incorporated in this ignitor unit.

INSPECTION



IGNITION COIL (Checking with Electro Tester)

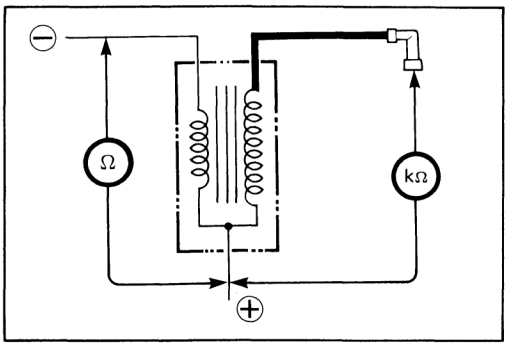
- Remove the ignition coils from the frame.
- Using the electro tester, test each ignition coil for sparking performance. The test connection is as indicated. Make sure that the three-needle sparking distance is at least 8 mm.
  If no sparking or orange color sparking occurs with this much gap, then it is defective and must be replaced.

09900-28106 : Electro tester

STD Spark performance : 8 mm (0.3 in)

IGNITION COIL (Checking with Pocket Tester)

- A SUZUKI pocket tester or an ohmmeter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings.
  Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with these approximate ohmic values.

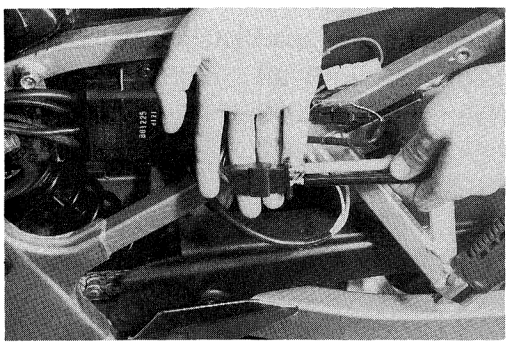


09900-25002 : Pocket tester

Ignition coil resistance
Primary : ⊕ tap – ⊖ tap 3 – 6 Ω
Tester range: (x 1 Ω)
Secondary : ⊕ tap – Plug cap 18 – 30 kΩ
Tester range: (x 1 kΩ)

SIGNAL GENERATOR (Checking with Pocket Tester)

- Remove the seat and left frame cover.
- Measure the resistance between lead wires. If the resistance is infinity or less than the specification, the signal generator must be replaced.



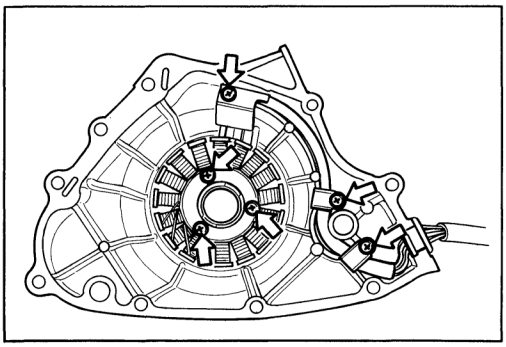
09900-25002 : Pocket tester

Signal coil resistance : Br – B/Bl, G/W – B/Bl } 250 – 420 Ω
Tester range: (x 100 Ω)

Wire color
Br : Brown
G/W : Green with White tracer
B/Bl : Black with Blue tracer

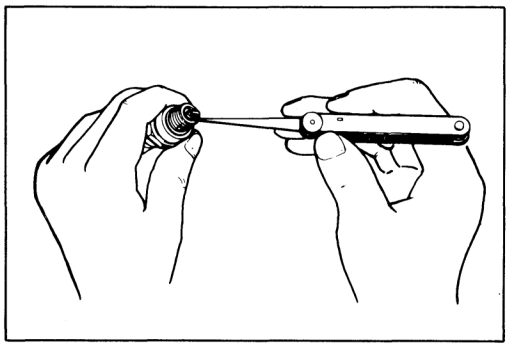
CAUTION:
When replacing the generator coil, apply a small quantity of THREAD LOCK "1342" to the mounting screws and lead wire guide screws.

99000-32050 : THREAD LOCK "1342"



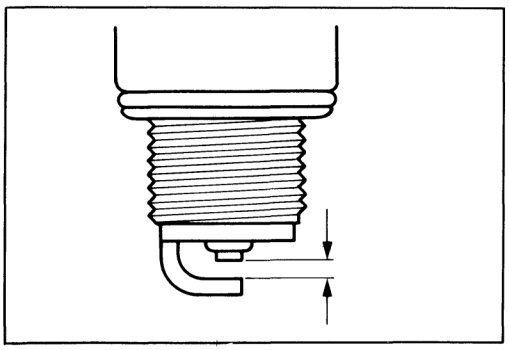
SPARK PLUG

- Clean the plug with a wire brush and pin. Use the pin to remove carbon, taking care not to damage the porcelain.



- Check the gap with a thickness gauge.

Spark plug gap : 0.8 – 0.9 mm (0.031 – 0.035 in)



Recommended spark plug

ND: X24EPR-U9 . . . . . Standard
ND: X22EPR-U9 . . . . . Hot type
ND: X27EPR-U9 . . . . . Cold type
NGK: DPR8EA-9 . . . . . Standard
NGK: DPR7EA-9 . . . . . Hot type
NGK: DPR9EA-9 . . . . . Cold type

NOTE:
"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.

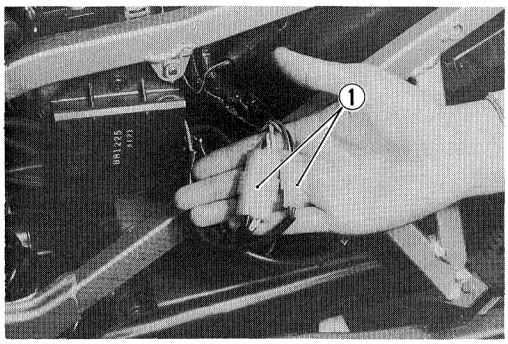
IGNITOR UNIT (Checking with Digital Ignitor Checker)

This section explains the checking procedure for the ignitor unit using Digital Ignitor Checker (special tool). With this checker, the ignitor unit can be checked either on the machine or off the machine. The following explains the checking procedure on the machine.

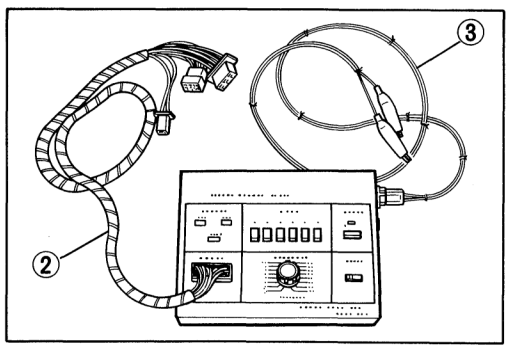
09931-64411 : Digital ignitor checker

WIRING PROCEDURE:

- Remove the seat.
- Remove the left frame cover.
- Disconnect two ignitor lead wire couples ① at the ignitor unit.



- Prepare the ignitor checker lead wire "MODE 5" ② which comes supplied with the ignitor checker and connect its end to the ignitor unit and another end to the checker.
- Connect the power source leads ③ to the battery.



CAUTION:

* **Be sure that the BLACK lead is connected to the battery ⊖ terminal and RED lead to the ⊕ terminal.**
* **Before connecting the power source leads, make sure that both "POWER" button and "START" switch are in "off" position (POWER button not depressed)**

NOTE:

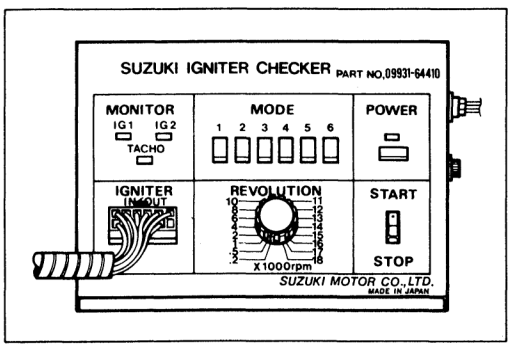
Be sure that the battery used is in fully-charged condition.

CHECK PROCEDURE:

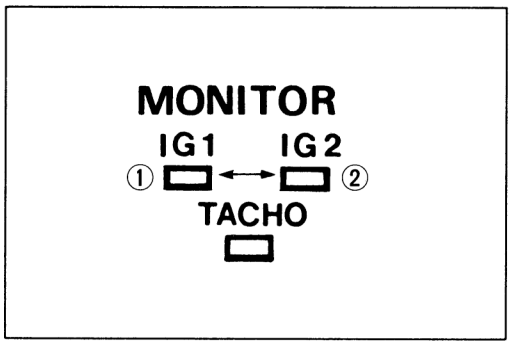
With all the lead wires properly connected, check the ignitor unit in the following three steps.

First Step:

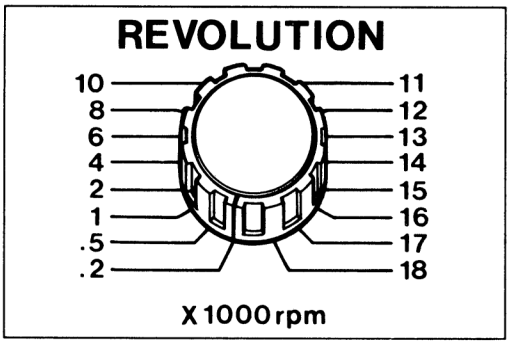
Depress "MODE 5" button then "POWER" button. This time, "POWER" lamp should come on, if not, battery is under-charged.

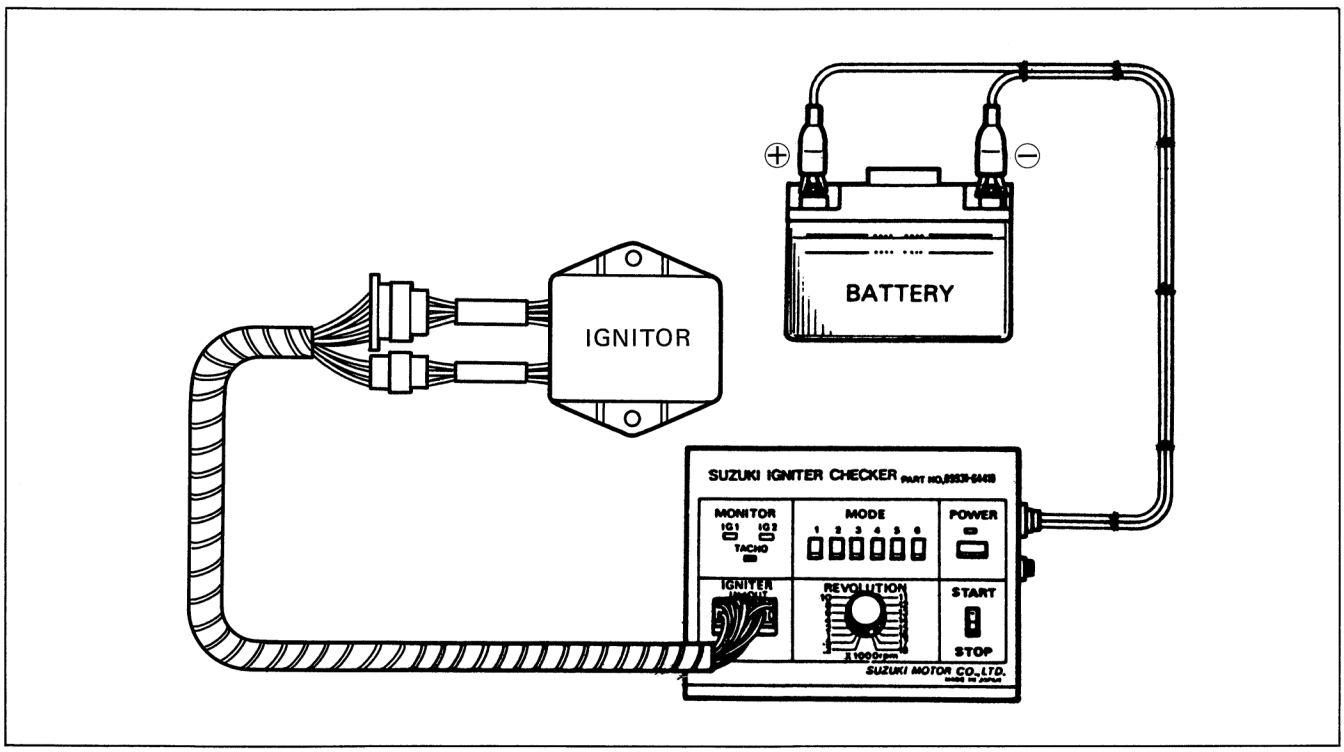


Second Step:
Set "REVOLUTION" dial pointer to ".2" position in which the checker produces the ignition primary current pulses simulating 200 r/min of engine revolution when "START" switch is turned on. With "START" switch is turned to ON position, check that two "MONITOR" lamps turn on and off in slow frequency in order of ①—② as illustrated.



Third Step:
Turn "REVOLUTION" Dial up gradually (assuming the engine is gradually revved up) and check that the MONITOR lamp flash frequency as explained in the second step above increases. As the dial pointer passes beyond the graduation "1" (1 000 r/min), all the two lamps should show continuously lighted.
If the lamps go off at the graduation below "10", the engine can not perform properly and therefore the ignitor unit must be replaced.

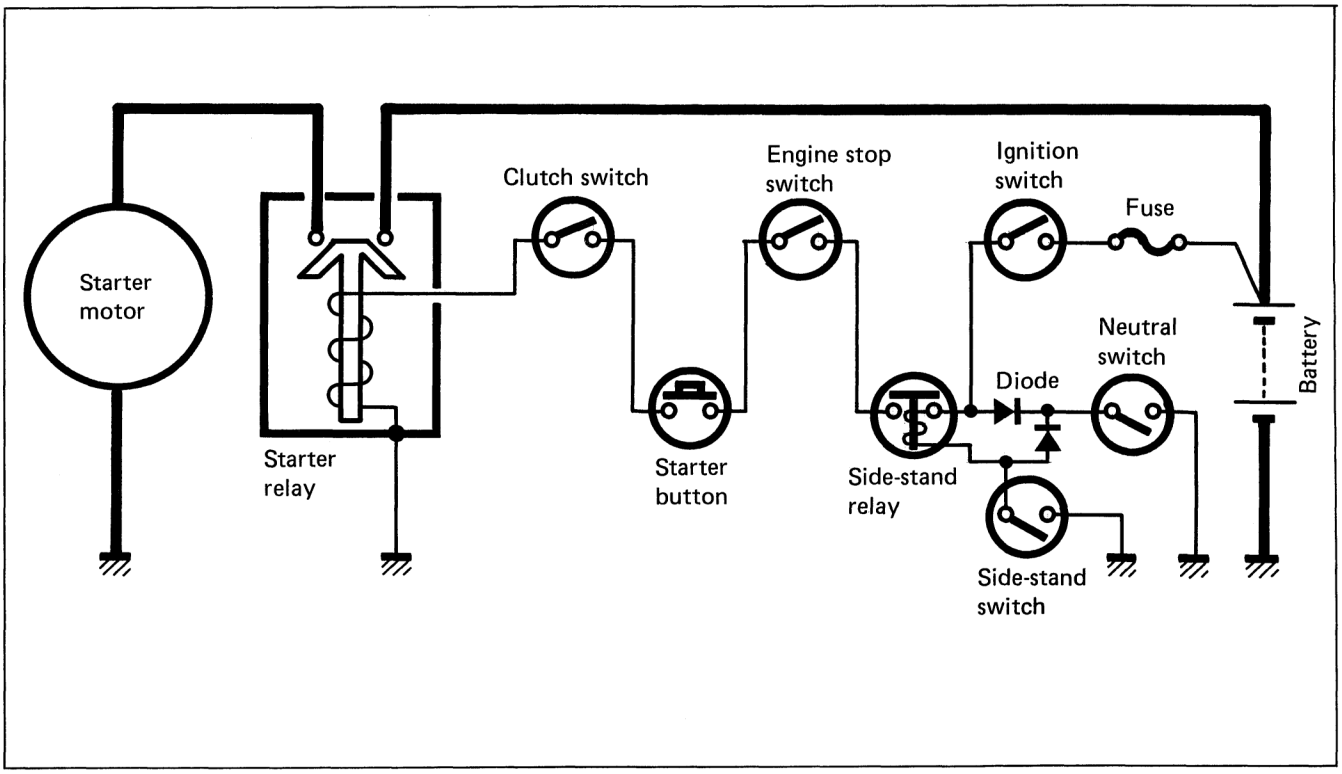




STARTER SYSTEM

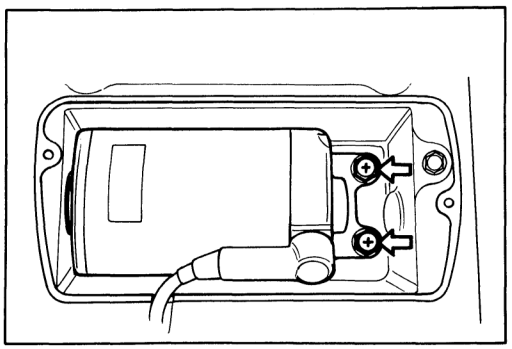
DESCRIPTION

The starter system is shown in the diagram below: namely, the starter motor, starter relay, side stand relay, interlock switch, starter button, engine stop switch, side stand switch, IG switch and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.

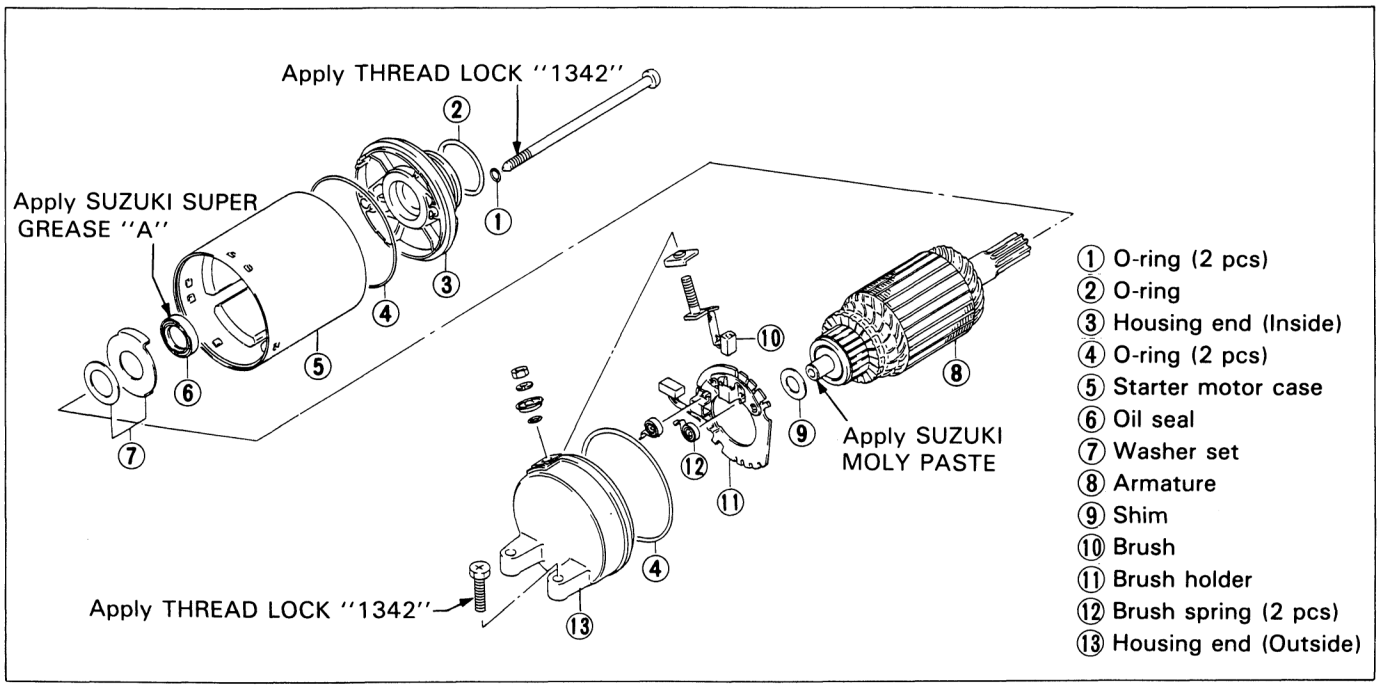


REMOVAL AND DISASSEMBLY

- Remove the starter motor cover.
- Disconnect the starter motor lead wire and remove the starter motor. (Refer to page 3-15.)



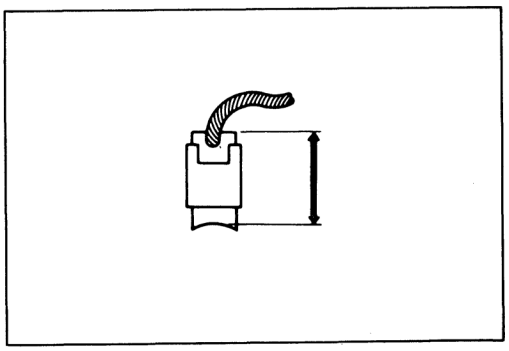
• Disassemble the starter motor as shown in the illustration.



INSPECTION

CARBON BRUSH

When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, measure the length of the brushes with a vernier calipers, replacing them when they are too short or chipping.



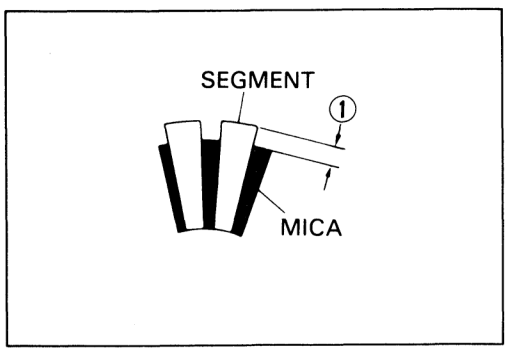
09900-20102 : Vernier calipers (200 mm)

Brush length	Service Limit
	9 mm (0.35 in)

COMMUTATOR

If the commutator surface is dirty, starting performance decreases. Polish the commutator with # 400 or similar fine emery paper when it is dirty. After polishing it, wipe the commutator with a clean dry cloth.

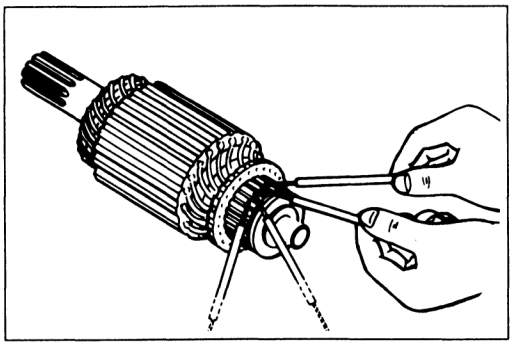
Measure the commutator under cut ① with a vernier calipers.



09900-20102 : Vernier calipers (200 mm)

Commutator under-cut	Service Limit
	0.2 mm (0.008 in)

ARMATURE COIL



Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.
If the coil is found to be open-circuited or grounded replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.

09900-25002 : Pocket tester

Tester knob indication : × 1Ω range

OIL SEAL

Check the seal lip for damage or oil leakage. If any damage is found, replace it.

REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

O-RING

CAUTION:
Replace the O-rings with new ones to prevent oil leakage and moisture.

HOUSING END (Inside)

- Apply grease to the lip of oil seal. (Refer to page 5-11.)

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

HOUSING END (Outside)

- Apply a small quantity of SUZUKI MOLY PASTE to the armature end. (Refer to page 5-11.)

99000-25140 : SUZUKI MOLY PASTE

- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing screws. (Refer to page 5-11.)

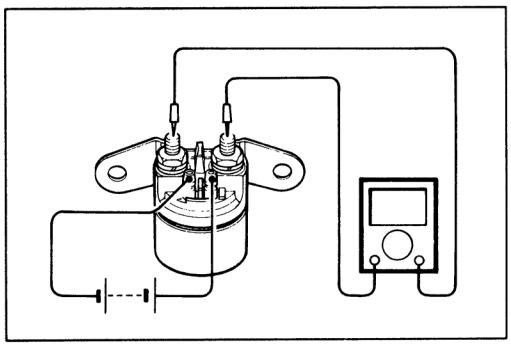
99000-32050 : THREAD LOCK "1342"

STARTER RELAY INSPECTION

- Disconnect the lead wire of starter motor at starter relay which is located battery holder of right side.
- Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when squeezing the clutch lever and pushing the starter button.
  If the starter relay is in sound condition, continuity is found.

09900-25002 : Pocket tester

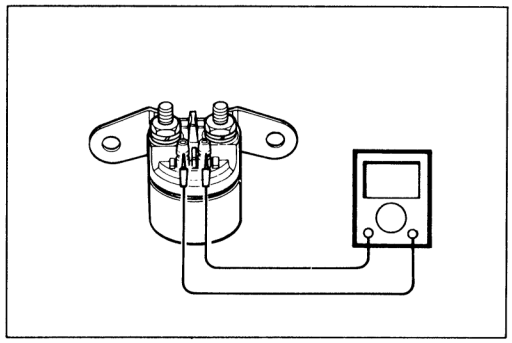
Tester knob indication : × 1Ω range



- Disconnect the lead wires from the starter relay.
- Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if the resistance is as follows.

09900-25002 : Pocket tester

Tester knob indication : × 1Ω range

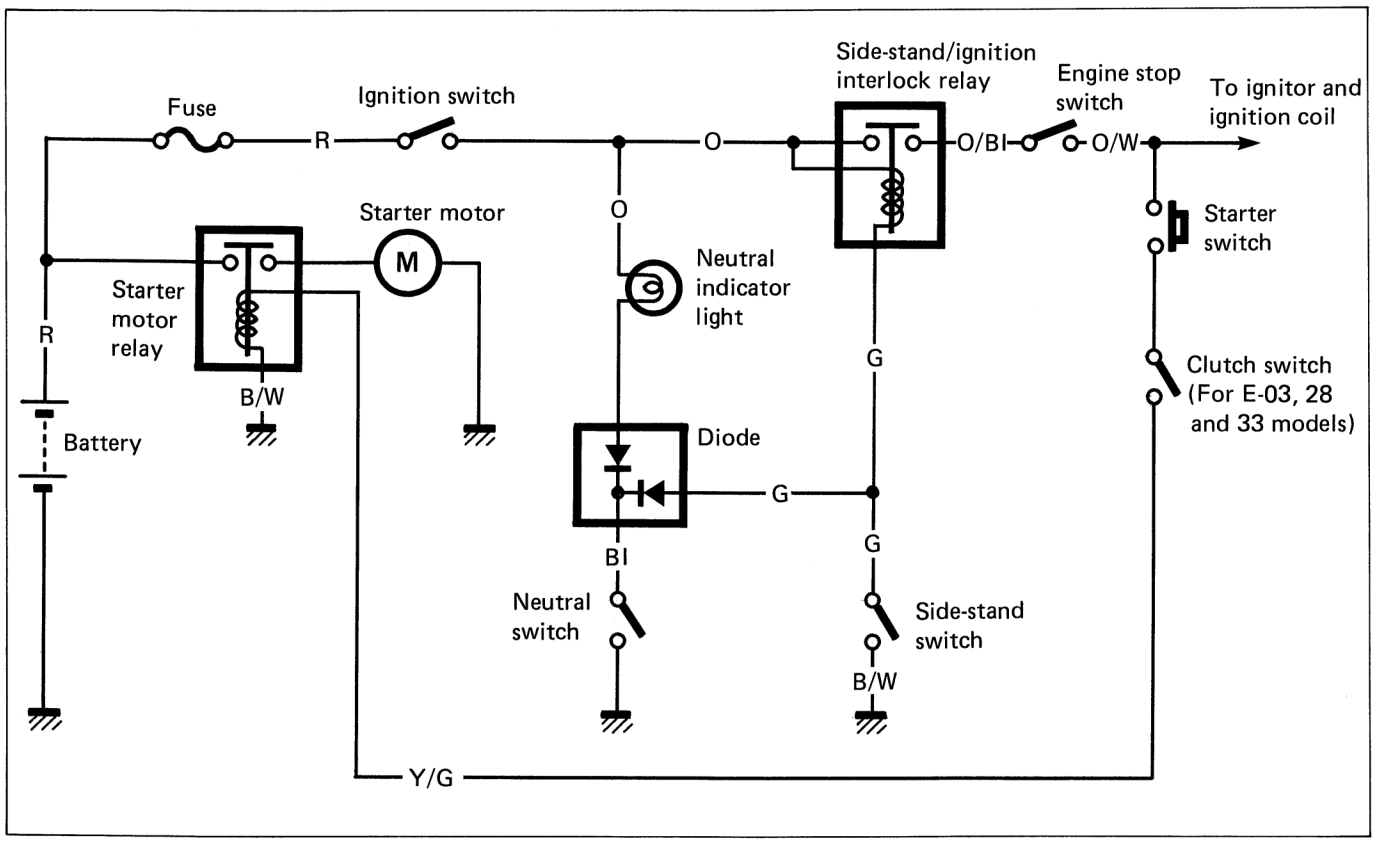


Starter relay resistance	Standard
	3 – 5Ω

SIDE-STAND/IGNITION INTERLOCK SYSTEM

DESCRIPTION

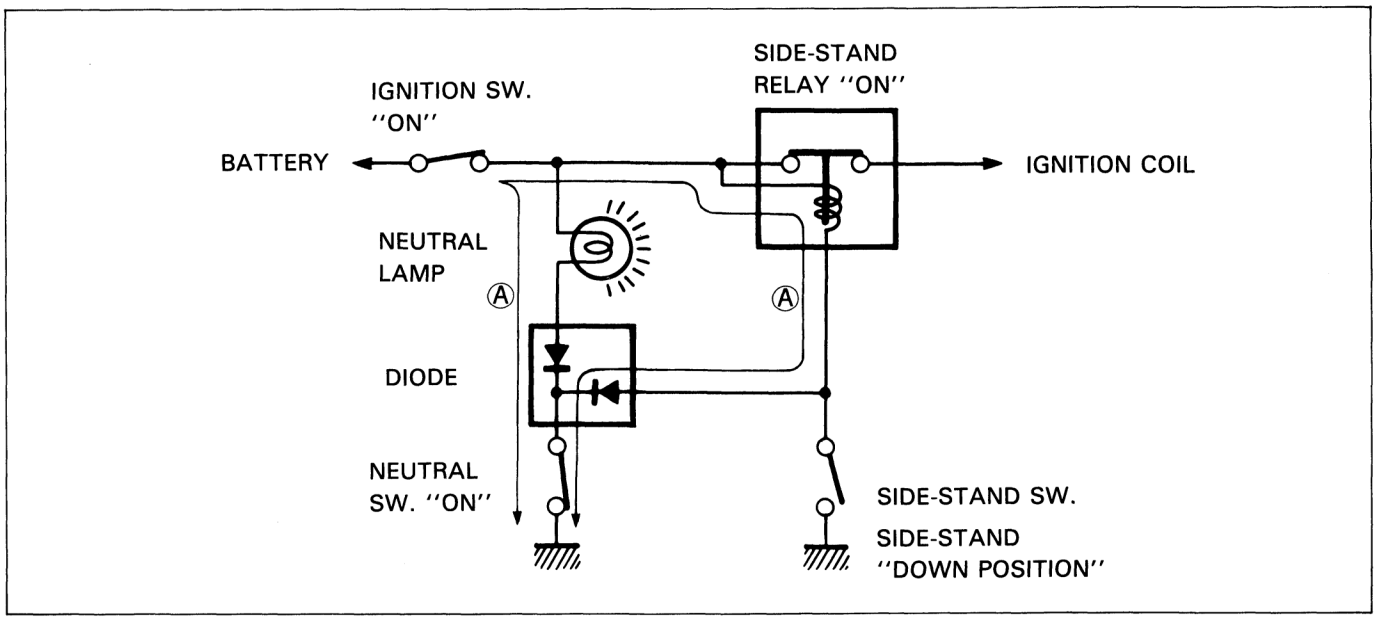
This side-stand/ignition interlock system is to prevent starting the motorcycle with the side-stand left down. The system is operated by an electric circuit provided between the battery and ignition coil.



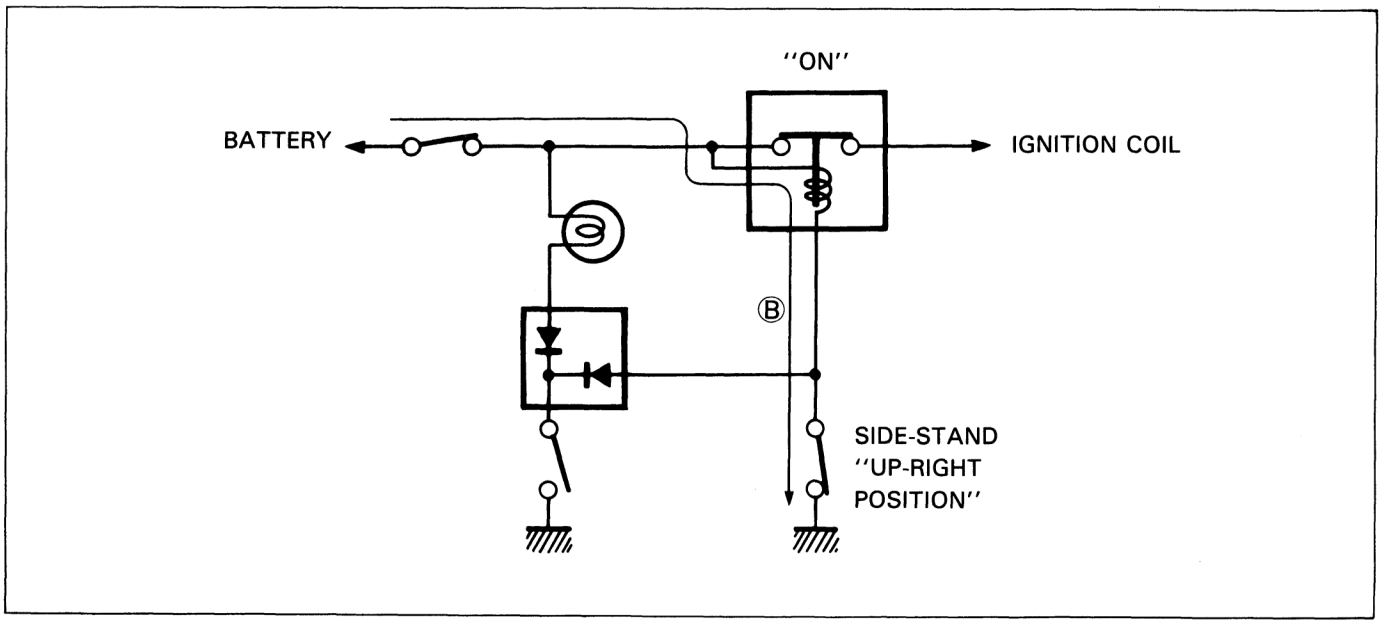
The circuit consists of relay, lamp, diode and switches and decides to live the ignition coil depending on the position of the TRANSMISSION and SIDE-STAND with the neutral and side-stand switches working mutually.

The ignition coil lives only in two situations as follows:

1. Transmission: "NEUTRAL (ON)" Side-stand: "DOWN (OFF)"
   The current flow Ⓐ turns "ON" the relay and the ignition coil lives even the side-stand is kept down. This is for warming up the engine.



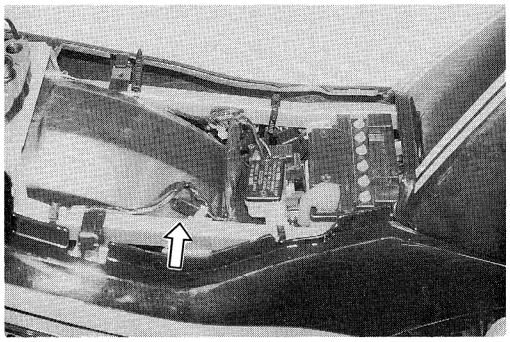
2. Side-stand: "UP-RIGHT (ON)"
   The current flow Ⓑ turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



INSPECTION

If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

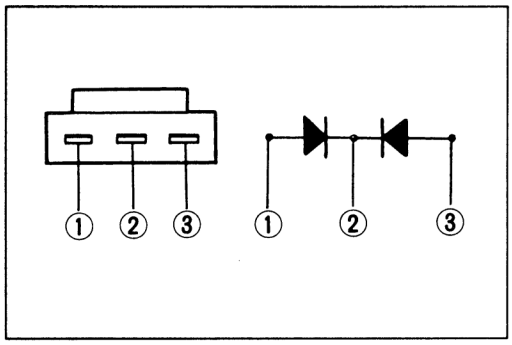
09900-25002 : Pocket tester



Diode

The diode is located behind the rear brake reservoir tank.
The diode can pass current only in one direction.

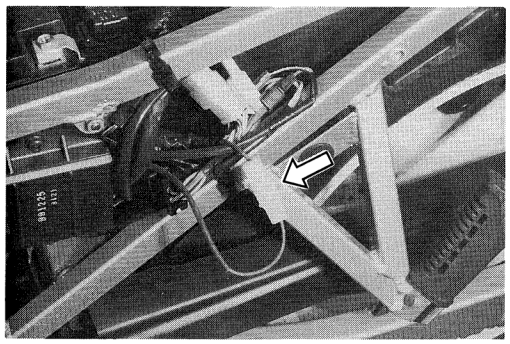
- Check the continuity between ① and ②. If one way continuity the diode is in good condition.
- Also check the continuity between ② and ③ as required.



Neutral switch

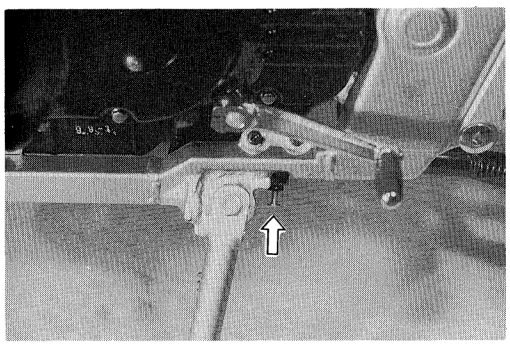
The neutral lead wire coupler is located behind the left frame cover.

- Disconnect the neutral switch lead and check the continuity between BI and ground with the transmission in "NEUTRAL".



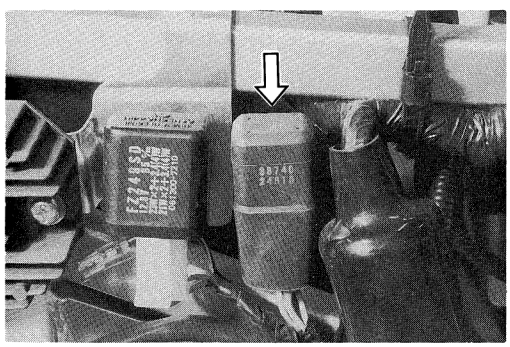
Side-stand switch

	G	B/W
ON (UP-right position)	○———	———○
OFF (Down position)		

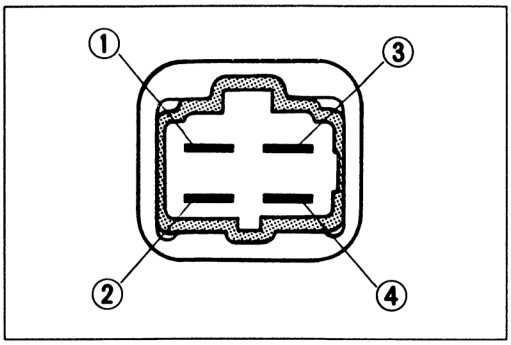


Side-stand/ignition interlock relay

The side-stand/ignition interlock relay is located behind the right frame cover.



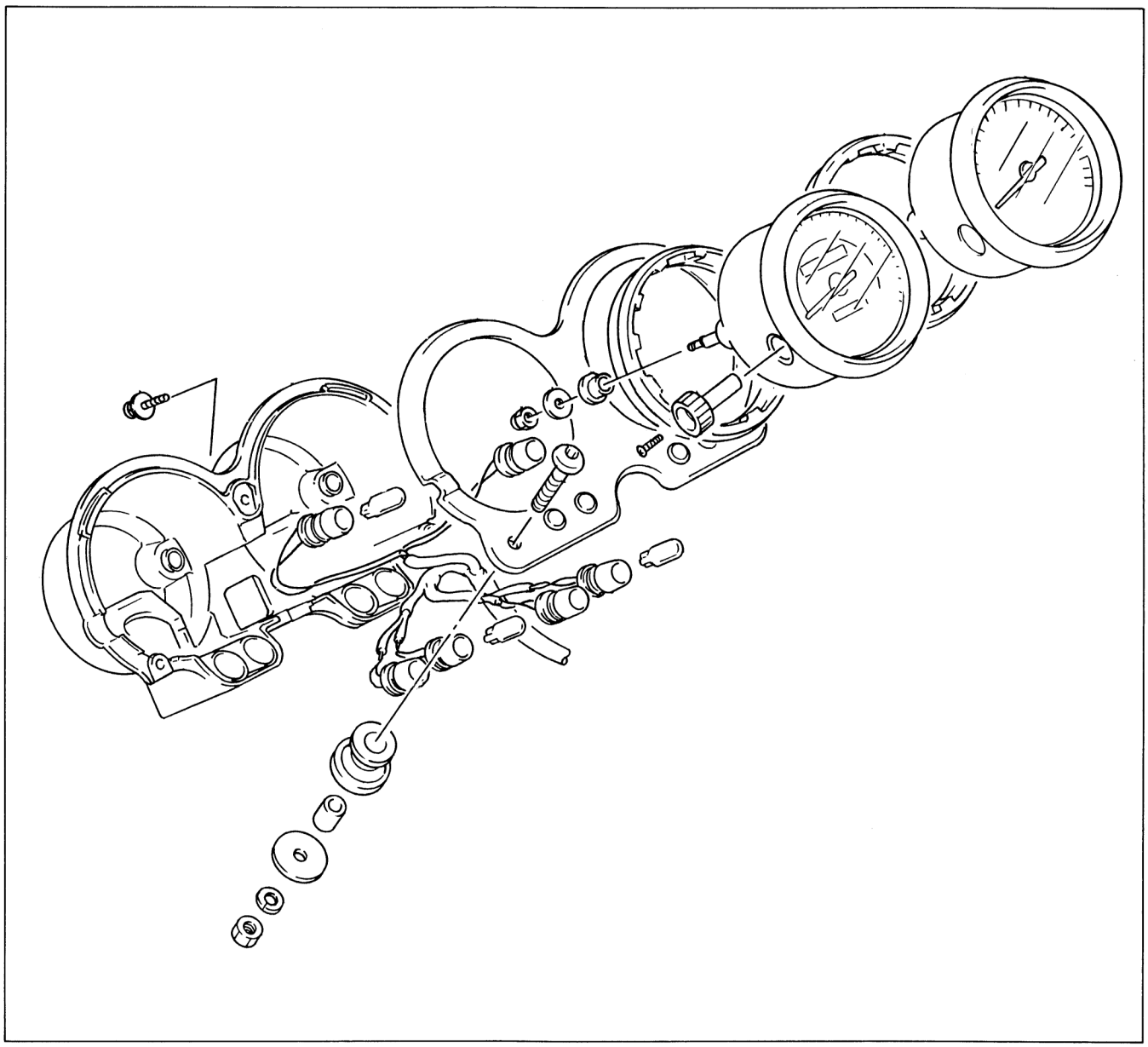
First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.
If there is no continuity, replace it with a new one.



COMBINATION METER

REMOVAL AND DISASSEMBLY

- Disassemble the combination meter as follows.



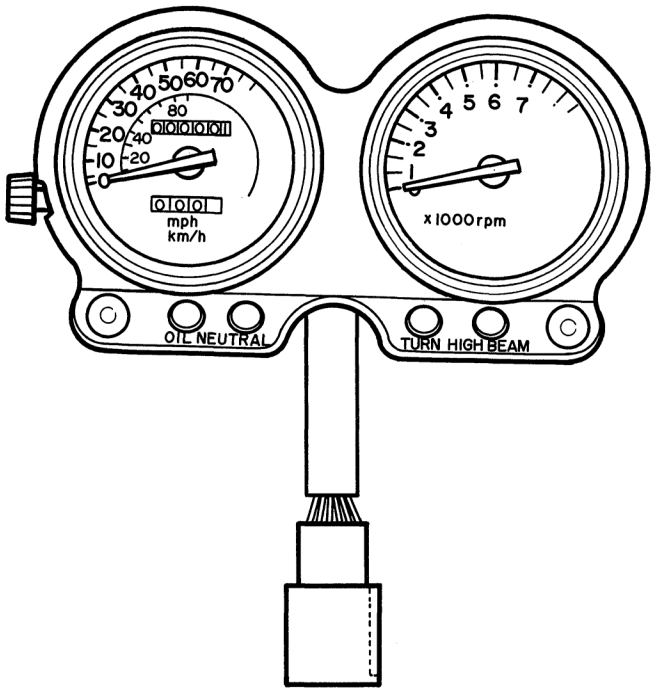
INSPECTION

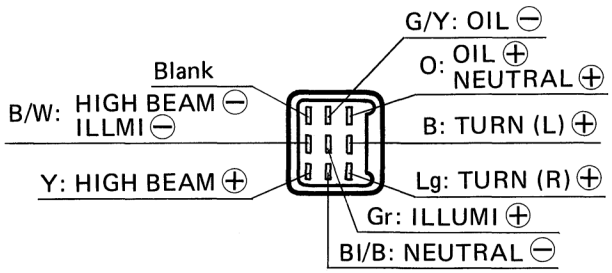
Using the pocket tester, check the continuity between lead wires in the diagram as shown below.
If the continuity measured is incorrect, replace the respective parts.

09900-25002 : Pocket tester

Tester knob indication : × 1Ω range

NOTE:
When making this test, it is not necessary to remove the combination meter.



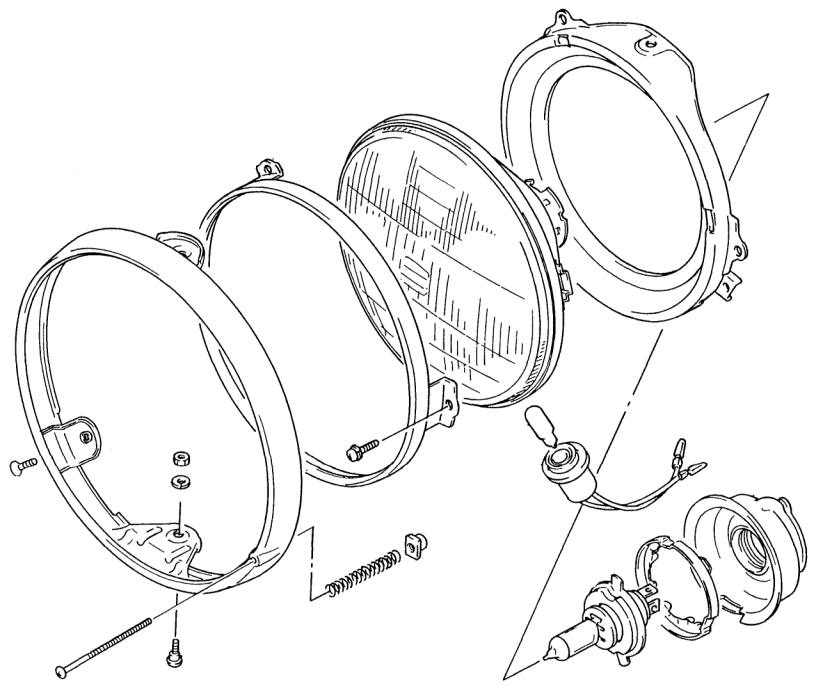


ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
TURN SIGNAL	B	Lg
ILLUMI.	Gr	B/W
HIGH BEAM	Y	B/W
OIL	O	G/Y
NEUTRAL	O	Bl/B

WIRE COLOR
B : Black
Lg : Light green
O : Orange
Gr : Gray
Y : Yellow
Bl/B: Blue with Black tracer
B/W: Black with White tracer
G/Y: Green with Yellow tracer

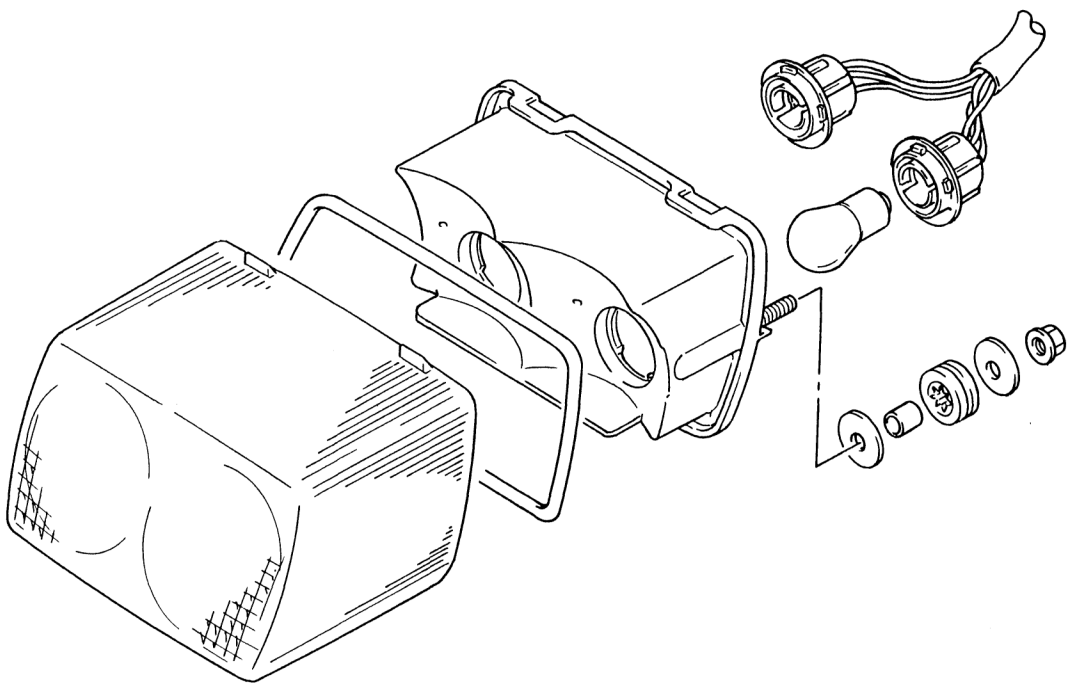
LAMPS

HEADLIGHT

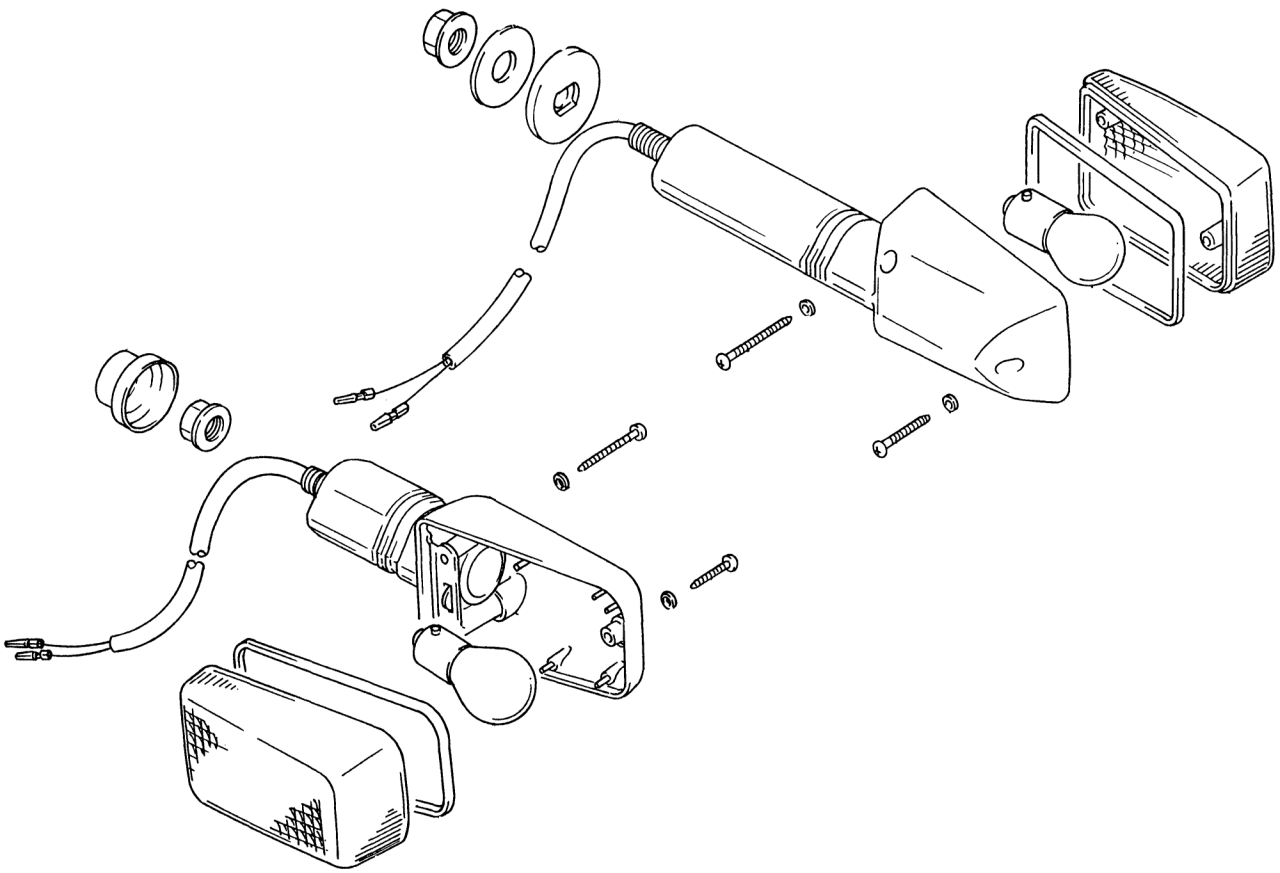


NOTE:
Adjust the headilight, both vertical and horizontal, after reassembling.

TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT



CAUTION: Do not overtighten the lens fitting screws.

SWITCHES

Inspect each switch for continuity with the pocket tester referring to the wiring diagram. If any abnormality is found, replace the respective switch assemblies with new ones. (Refer to the chapter 7 of wiring diagram.)

09900-25002 : Pocket tester

Tester knob indication : × 1Ω range

OIL PRESSURE SWITCH

- Continuity, when engine is stopped.
- No continuity, when engine is running.

	G/Y	Ground
ON	○———	———○
OFF		

NOTE:
Before inspecting the oil pressure switch, check if the engine oil level is enough.

RELAY

STARTER RELAY

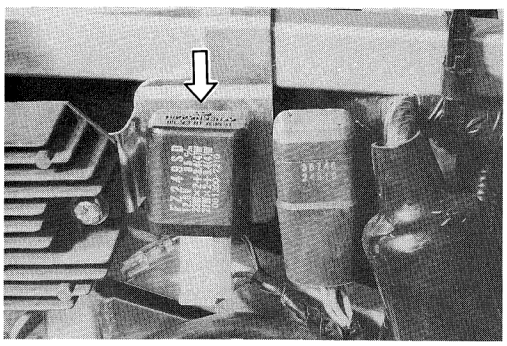
The starter relay is located on the battery holder of right side.
(Refer to page 5-13 for details.)

SIDE-STAND RELAY

The side-stand relay is located behind the right frame cover.
(Refer to page 5-15 for details.)

TURN SIGNAL RELAY

The turn signal relay is located behind the right frame cover.
If the turn signal light does not light, inspect the bulb or repair the circuit connection.
If the bulb and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.



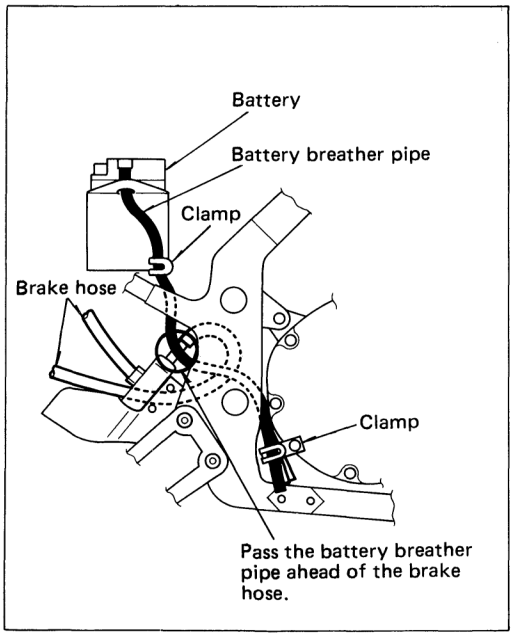
NOTE:
Be sure that the battery used is in fully-charged condition.

BATTERY

SPECIFICATIONS

Type designation	FB10L-B2
Capacity	12V, 39.6 kC (11 Ah)/10HR
Standard electrolyte S.G.	1.28 at 20° C (68° F)

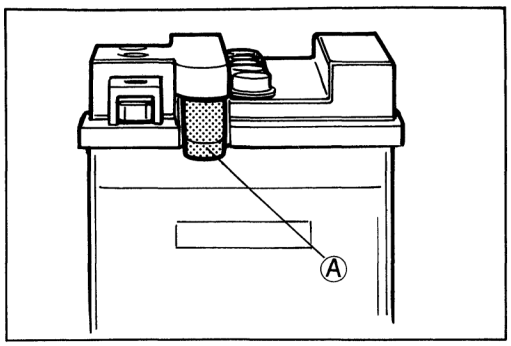
In fitting the battery to the motorcycle, connect the breather hose to the battery vent.



INITIAL CHARGING

FILLING ELECTROLYTE

Remove the short sealed tube Ⓐ before filling electrolyte. Fill the battery with electrolyte (dilute sulfuric acid solution with acid concentration of 35.0% by weight, having a specific gravity of 1.28 at 20°C (68°F)) up to indicated MAX. LEVEL. Electrolyte should be always cooled below 30°C (86°F) before filling into battery. Leave battery standing for half an hour after filling. Add additional electrolyte if necessary. Charge battery with current as described in the table shown below.



Maximum charging current	1.4A

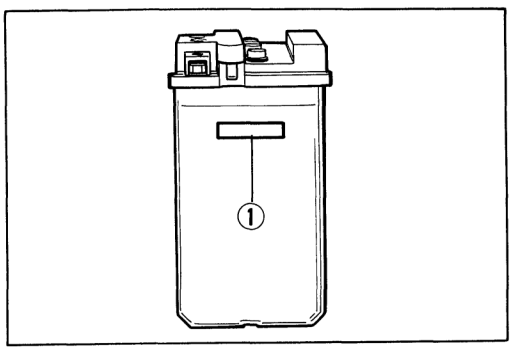
CHARGING TIME

The charging time for a new battery is determined by the number of months that have elapsed since the date of manufacture.

CONFIRMATION FOR DATE OF MANUFACTURE

Date of manufacture is indicated by a three-part number ①, as shown in the photograph, each indicating month, date and year.

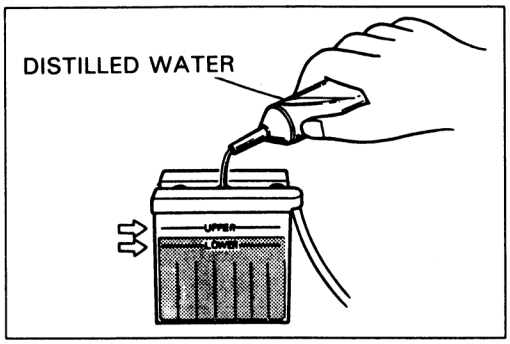
Near the end of charging period, adjust the specific gravity of electrolyte to value specified. After charging, adjust the electrolyte level to the MAX. LEVEL with DISTILLED WATER.



SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

Check the electrolyte level and add distilled water, as necessary to raise the electrolyte to each cell's MAX. level.
Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.22 or less, as corrected to 20°C (68°F), it means that the battery is still in a run-down condition and needs recharging.



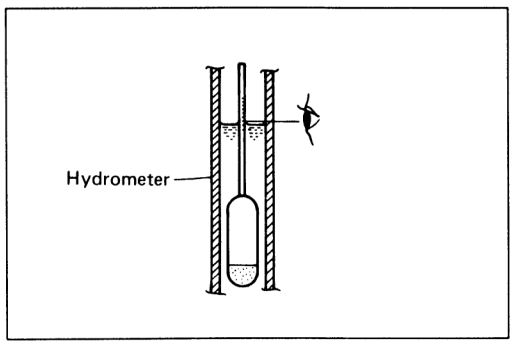
NOTE:
First, remove the ⊖ lead wire.

Months after manufacturing	Within 6	Within 9	Within 12	Over 12
Necessary charging hours	20	30	40	60

RECHARGING OPERATION BASED ON S.G. READING

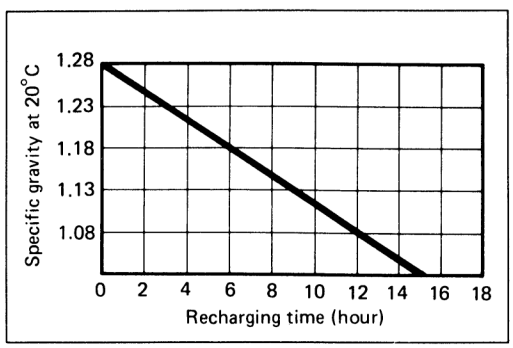
To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in figure.

09900-28403 : Hydrometer



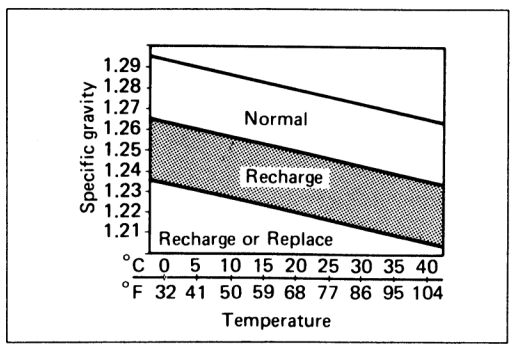
Check the reading (as corrected to 20°C) with chart to determine the recharging time in hour by constant-current charging at a charging rate of 1.4 amperes (which is tenth of the capacity of the present battery).

Electrolyte specific gravity	1.28 at 20°C (68°F)

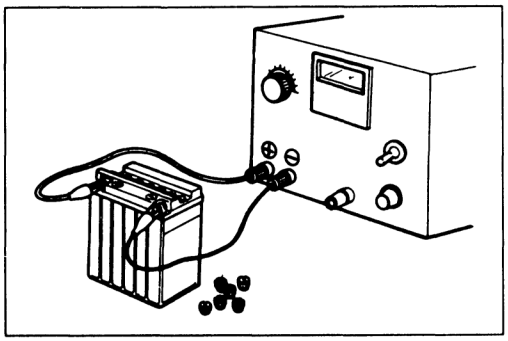


Be careful not to permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

CAUTION:
Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.



SERVICE LIFE



Lead oxide is applied to the pole plates of the battery which will come off gradually during the service. When the bottom of the battery case becomes full of the sediment, the battery cannot be used any more. If the battery is not charged for a long time, lead sulfate is generated on the surface of the pole plates and will deteriorate the performance (sulfation). Replace the battery with new one in such a case.
When a battery is left for a long term without using, it is apt to subject to sulfation. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

WARNING:

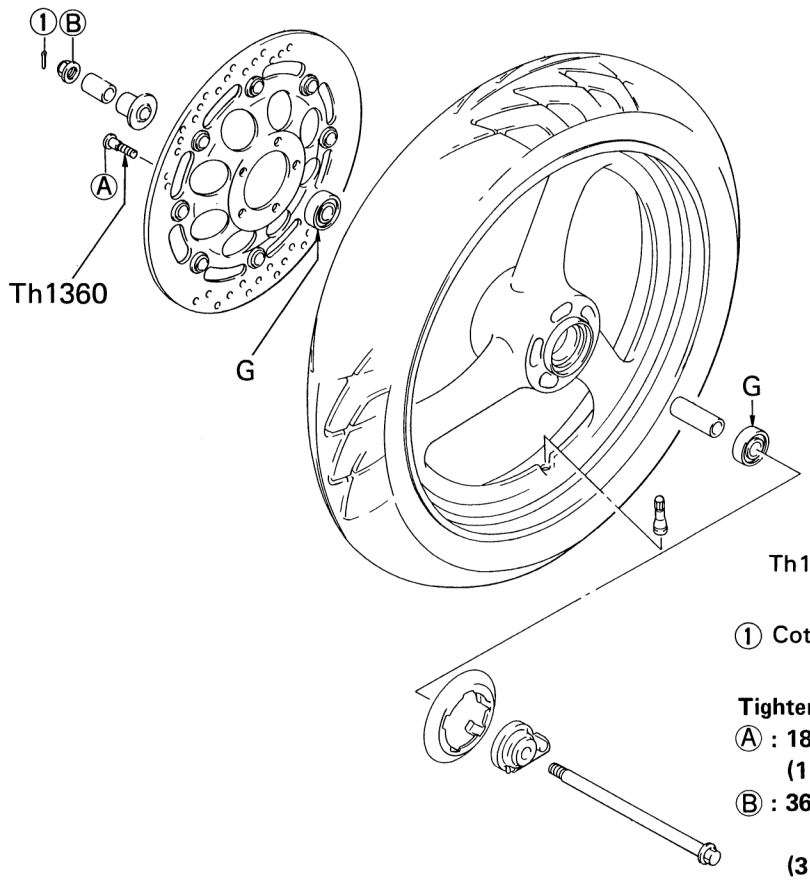
* **Before charging a battery, remove the seal cap from each cell.**
* **Keep fire and sparks away from a battery being charged.**
* **When removing a battery from the motorcycle, be sure to remove the ⊖ terminal first.**

CHASSIS

CONTENTS

FRONT WHEEL 6- 1
REMOVAL 6- 1
INSPECTION AND DISASSEMBLY 6- 2
REASSEMBLY AND REMOUNTING 6- 4
FRONT BRAKE 6- 7
BRAKE RAD REPLACEMENT 6- 7
CALIPER REMOVAL AND DISASSEMBLY 6- 8
CALIPER AND DISC INSPECTION 6- 9
CALIPER REASSEMBLY AND REMOUNTING 6-10
MASTER CYLINDER REMOVAL AND DISASSEMBLY 6-10
MASTER CYLINDER INSPECTION 6-11
MASTER CYLINDER REASSEMBLY AND REMOUNTING ... 6-11
FRONT FORK 6-13
REMOVAL 6-13
DISASSEMBLY 6-14
INSPECTION 6-16
REASSEMBLY AND REMOUNTING 6-16
STEERING 6-19
REMOVAL 6-19
DISASSEMBLY 6-20
INSPECTION 6-20
REASSEMBLY AND REMOUNTING 6-21
STEERING TENSION ADJUSTMENT 6-22
IGNITION SWITCH 6-23
REAR BRAKE 6-24
BRAKE RAD REPLACEMENT 6-24
CALIPER REMOVAL AND DISASSEMBLY 6-25
CALIPER AND DISC INSPECTION 6-26
CALIPER REASSEMBLY AND REMOUNTING 6-26
MASTER CYLINDER REMOVAL AND DISASSEMBLY 6-27
MASTER CYLINDER INSPECTION 6-28
MASTER CYLINDER REASSEMBLY AND REMOUNTING ... 6-29
REAR WHEEL 6-30
REMOVAL 6-30
INSPECTION AND DISASSEMBLY 6-32
REASSEMBLY AND REMOUNTING 6-33
TIRE AND WHEEL 6-36
TIRE REMOVAL 6-36
INSPECTION 6-38
TIRE MOUNTING 6-39
REAR SUSPENSION 6-41
SWINGARM 6-41
SHOCK ABSORBER AND CUSHION LEVER 6-42
REMOVAL 6-43
INSPECTION 6-44
DISASSEMBLY 6-45
REASSEMBLY INFORMATION 6-47
REASSEMBLY AND REMOUNTING 6-48
FINAL INSPECTION AND ADJUSTMENT 6-50
SHOCK ABSORBER SPRING PRE-LOAD 6-50

FRONT WHEEL



Th1360 : Apply THREAD LOCK "1360"
G : Apply SUPER GREASE "A"
① Cotter pin (For E-03, 28 and 33 models)

Tightening torque
Ⓐ : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)
Ⓑ : 36 – 52 N·m ... Normal nut with cotter pin
(3.6 – 5.2 kg-m, 26.0 – 37.5 lb-ft)
40 – 58 N·m ... Self-lock nut
(4.0 – 5.8 kg-m, 29.0 – 42.0 lb-ft)

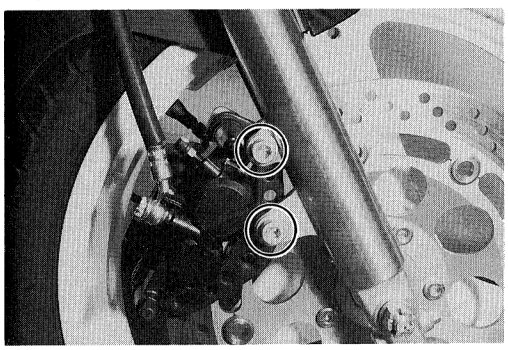
REMOVAL

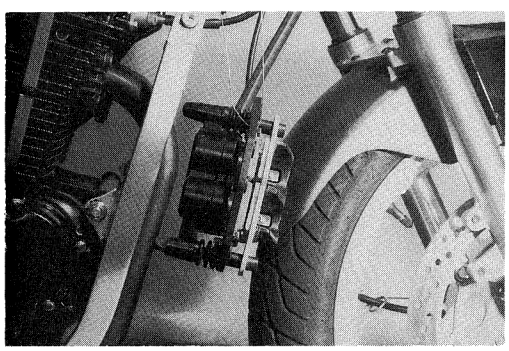
- Support the motorcycle by center stand and jack.
- Remove the brake caliper by removing the mounting bolts.

09900-00410 : Hexagon wrench set
(Not available in U.S.A)

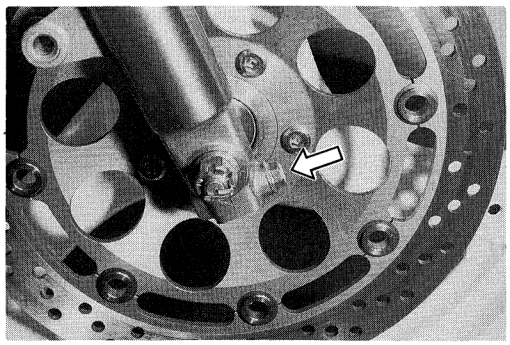
NOTE:
Do not operate the brake lever while dismounting the brake caliper.

CAUTION:
Hang the brake caliper from the motorcycle frame by using the string, etc., taking care not to bend the brake hose.

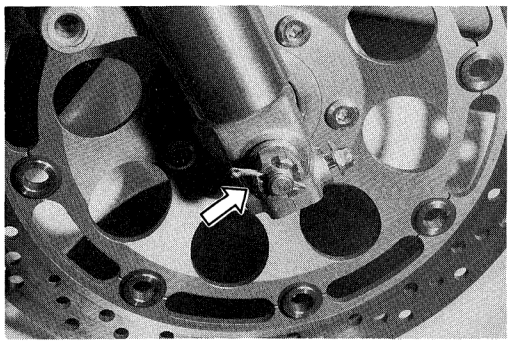




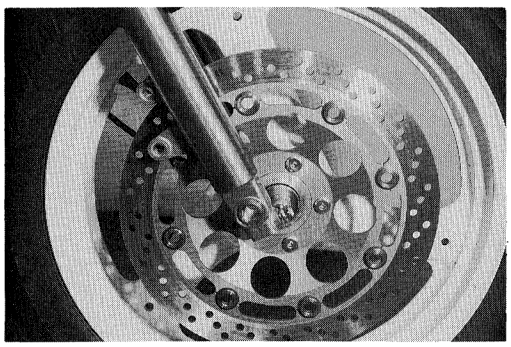
- Loosen the pinch bolt.



- Remove the cotter pin. (For E-03, 28 and 33 models)
- Remove the axle nut.
  E-03: U.S.A.
  E-28: Canada
  E-33: California (U.S.A.)

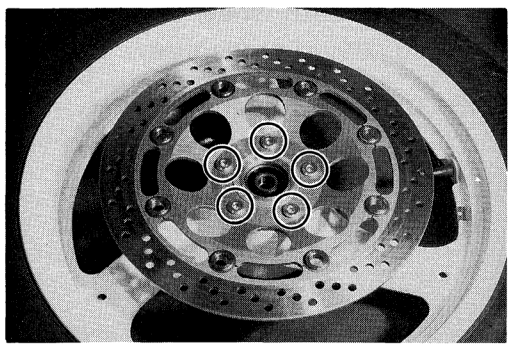


- Draw out the axle shaft and take off the front wheel.



- Remove the brake disc off the front wheel by removing the mounting bolts.

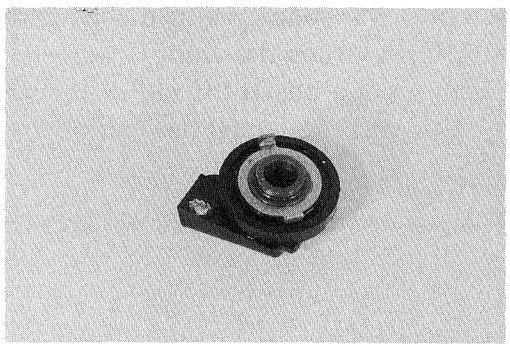
09900-00410 : Hexagon wrench set
(Not available in U.S.A)



INSPECTION AND DISASSEMBLY

SPEEDOMETER GEAR BOX DUST SEAL

Inspect the lip of dust seal for damage.

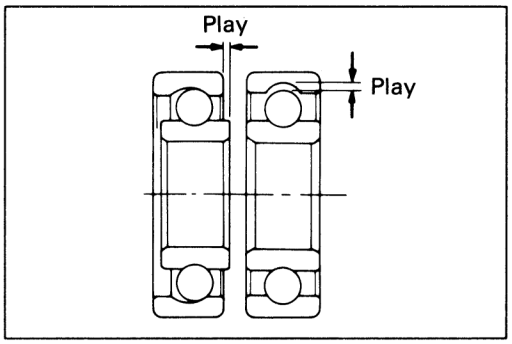


TIRE

Refer to page 6-36.

WHEEL BEARINGS

Inspect the play of the wheel bearings by hand while they are in the wheel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.

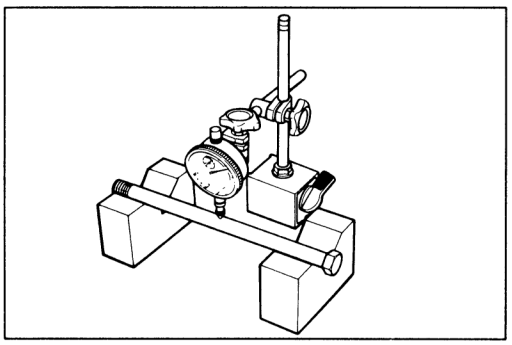


AXLE SHAFT

Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

09900-20606 : Dial gauge (1/100)
09900-20701 : Magnetic stand } **Not available**
09900-21304 : V-block set (100 mm) } **in U.S.A**

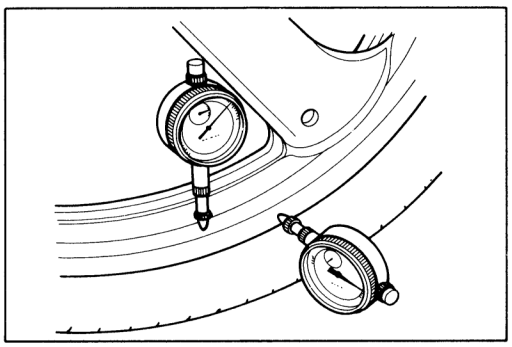
Service limit : 0.25 mm (0.010 in)



WHEEL

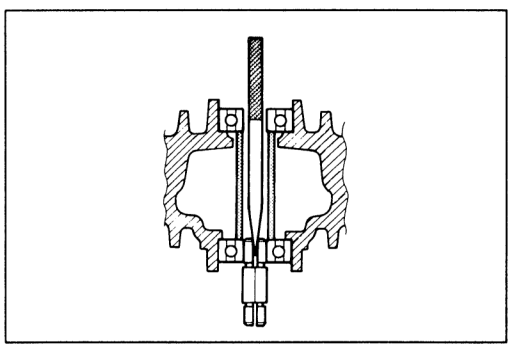
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loosen wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service limit (Axial and Radial) : 2.0 (0.08 in)



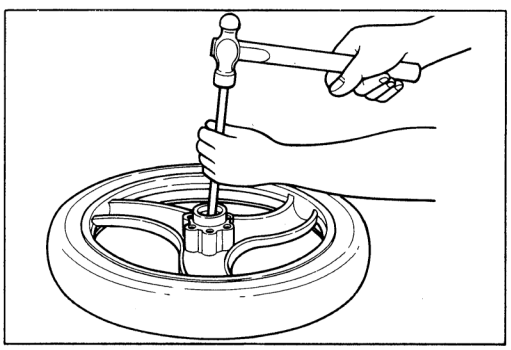
- Drive out both wheel bearings by using the special tool in the following procedures.

09941-50110 : Bearing remover
(Not available in U.S.A)



- Insert the adaptor into the wheel bearing.
- After inserting the wedge bar from the opposite side, lock the wedge bar in the slit of the adaptor.
- Drive out the wheel bearing by knocking the wedge bar.

CAUTION:
The removed bearings should be replaced with new ones.



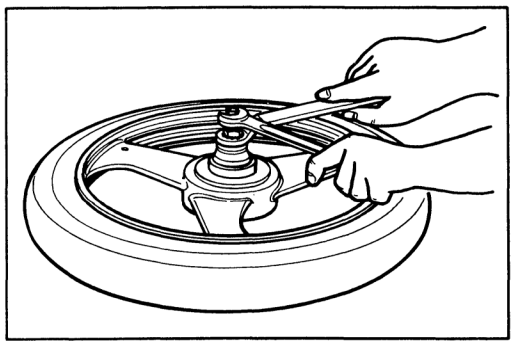
REASSEMBLY AND REMOUNTING

Reassemble and remount the front wheel in the reverse order of removal and disassembly. Pay attention to the following points:

WHEEL BEARING

- Apply grease to the bearing before installing.

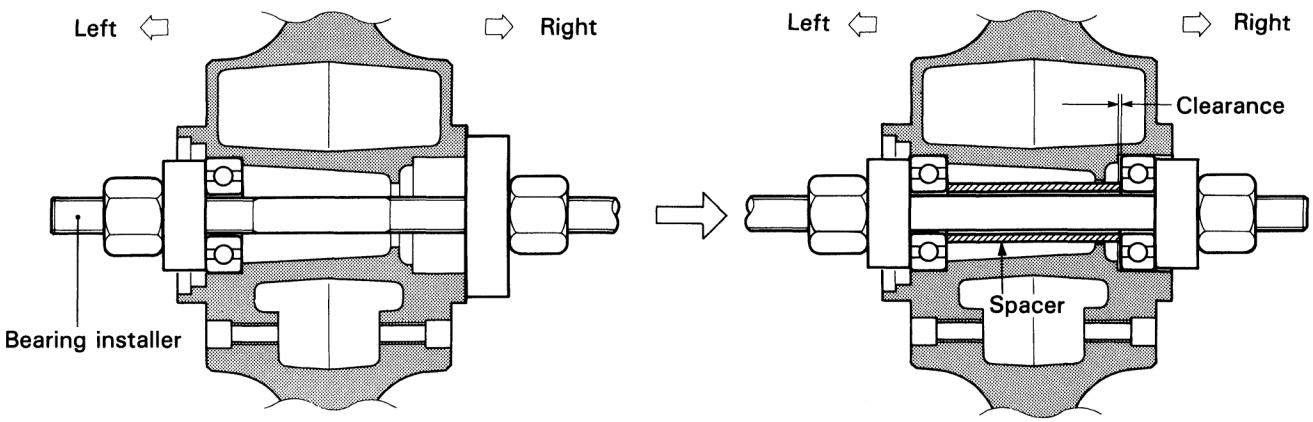
(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"



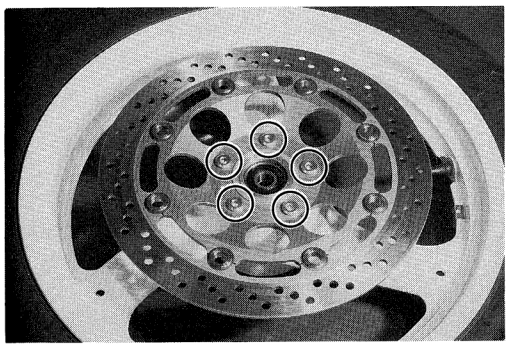
- Install the wheel bearings as follows by using the special tool.

09924-84510 : Bearing installer set

NOTE:
First install the left wheel bearing, then install the right wheel bearing. The sealed cover on the bearing is positioned out side.



BRAKE DISC

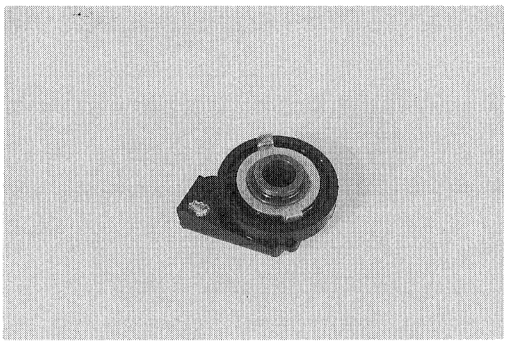


- Make sure that the brake disc is clean and free of any greasy matter. Apply THREAD LOCK "1360" to the disc mounting bolts and tighten them to the specified torque.

Tightening torque : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

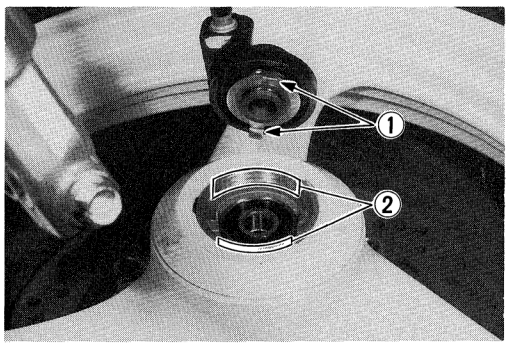
99000-32130 : THREAD LOCK "1360"

SPEEDOMETER GEARBOX

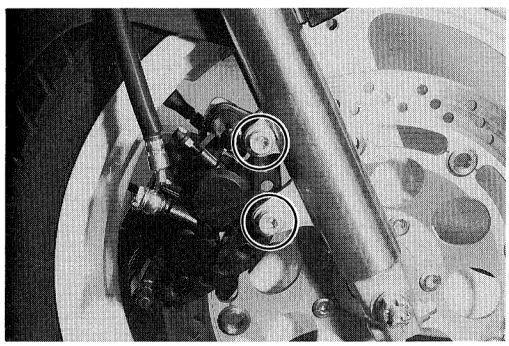


- Before installing the speedometer gearbox, apply grease to its dust seal lip and align the two drive lugs ① to the two recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub. When tightening the front axle, check to be sure that the speedometer gearbox is in the position so that the speedometer cable does not bend sharply.

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"



BRAKE CALIPER

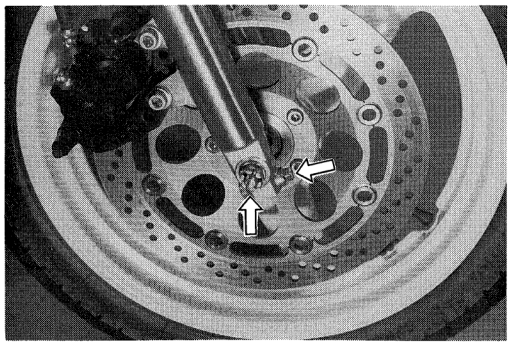


- Tighten the brake caliper mounting bolts to the specified torque.

Tightening torque : 30 – 48 N·m
(3.0 – 4.8 kg-m, 21.5 – 35.0 lb-ft)

NOTE:
Push the pistons all the way into the caliper and remount the caliper.

AXLE SHAFT



- Tighten the axle nut to the specified torque.

Tightening torque : 36 – 52 N·m ... Normal nut with cotter pin
(3.6 – 5.2 kg-m, 26.0 – 37.5 lb-ft)

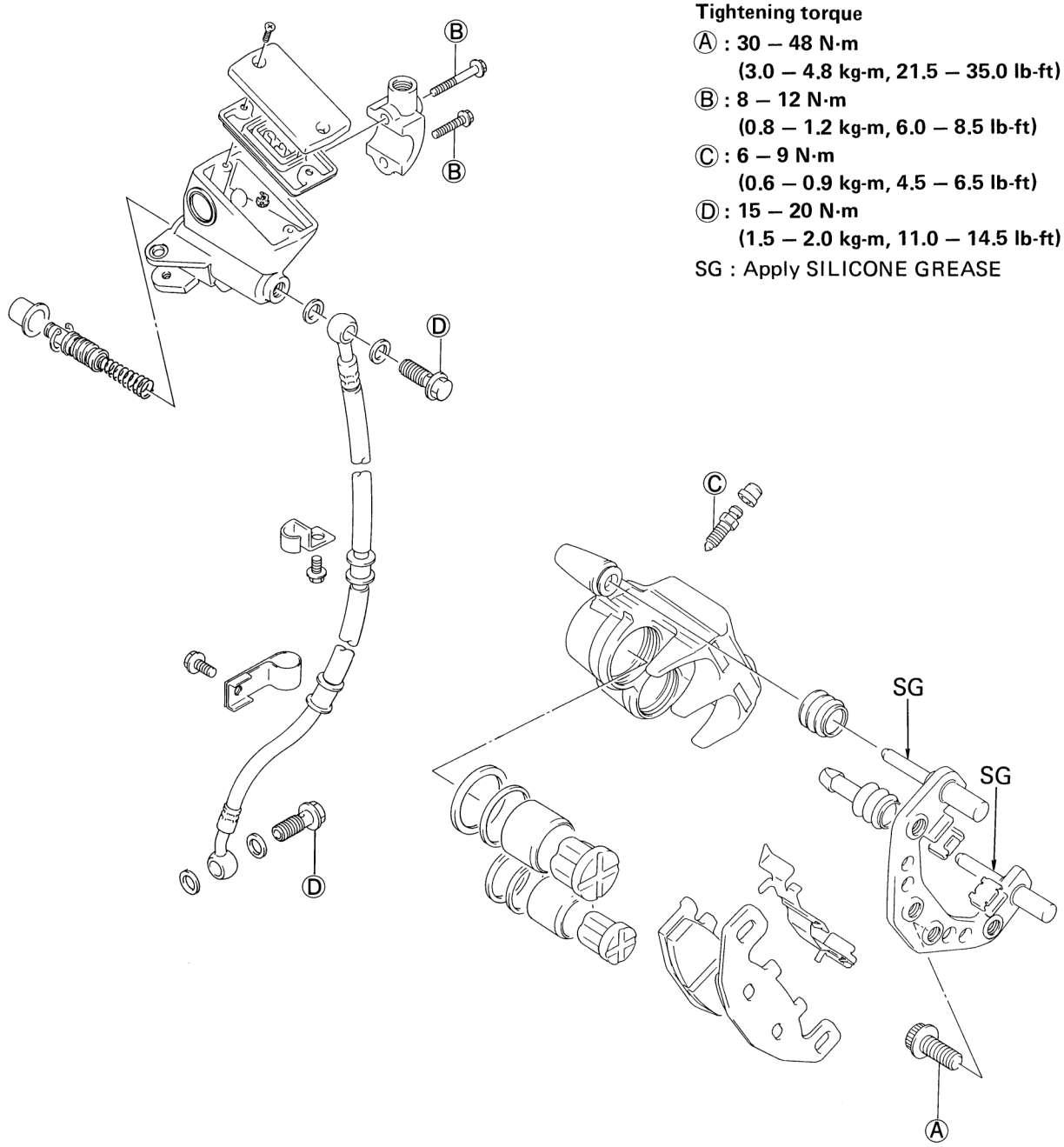
---

40 – 58 N·m ... Self-lock nut
(4.0 – 5.8 kg-m, 29.0 – 42.0 lb-ft)

- Tighten the pinch bolt to the specified torque.

Tightening torque : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

FRONT BRAKE



Tightening torque
Ⓐ : 30 – 48 N·m
(3.0 – 4.8 kg-m, 21.5 – 35.0 lb-ft)
Ⓑ : 8 – 12 N·m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)
Ⓒ : 6 – 9 N·m
(0.6 – 0.9 kg-m, 4.5 – 6.5 lb-ft)
Ⓓ : 15 – 20 N·m
(1.5 – 2.0 kg-m, 11.0 – 14.5 lb-ft)
SG : Apply SILICONE GREASE

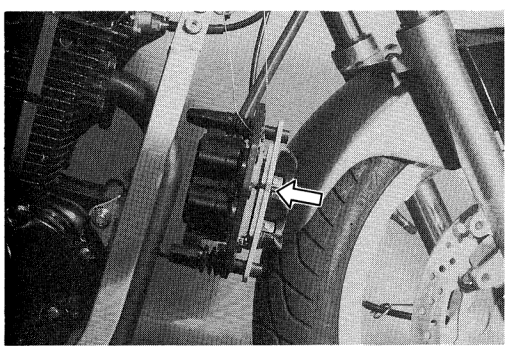
BRAKE PAD REPLACEMENT

- Remove the brake caliper by removing the mounting bolts.
- Remove the pads.

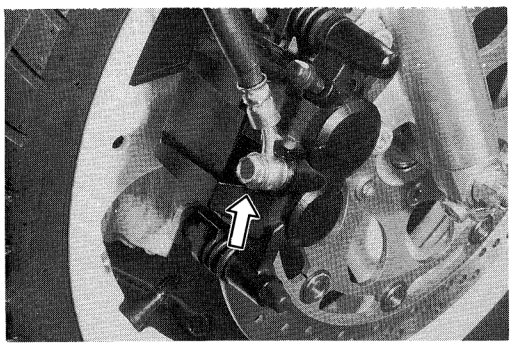
CAUTION:

*** Do not operate the brake lever while dismounting the pads.**

*** Replace the brake pad as a set, otherwise braking performance will be adversely affected.**



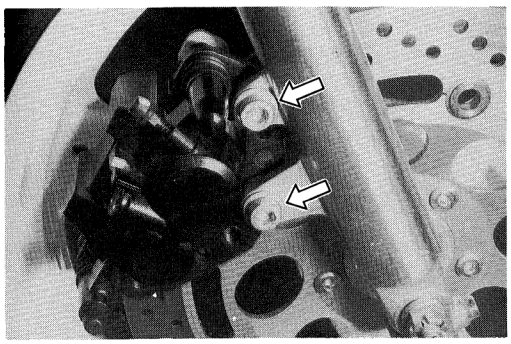
CALIPER REMOVAL AND DISASSEMBLY



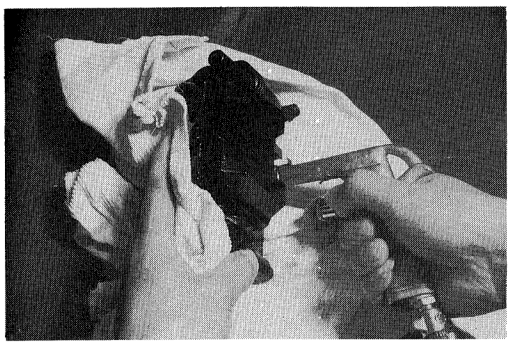
- Disconnect the brake hose by removing the union bolt and catch the brake fluid in a suitable receptacle.

CAUTION:
Never re-use the brake fluid left over from the servicing and stored for long periods.

WARNING:
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joint for cracks and oil leakage.

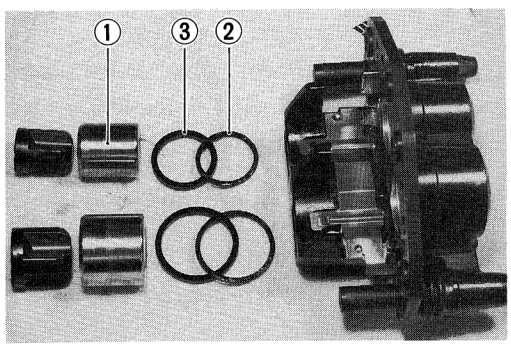


- Remove the caliper mounting bolts and take off the caliper.
- Remove the pads.



- Place a rag over the pistons to prevent them from popping out and push out the pistons by using the air gun.

CAUTION:
Do not use high pressure air to prevent piston damage.

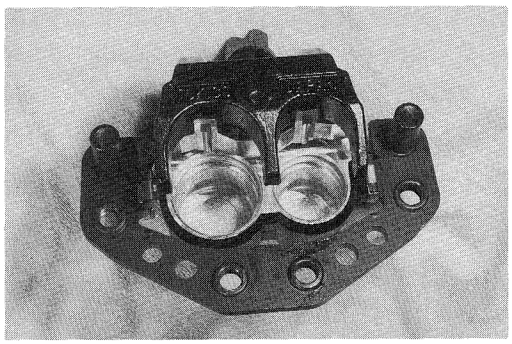


- Remove the piston ①, dust seal ② and piston seal ③ out of the caliper.

CALIPER AND DISC INSPECTION

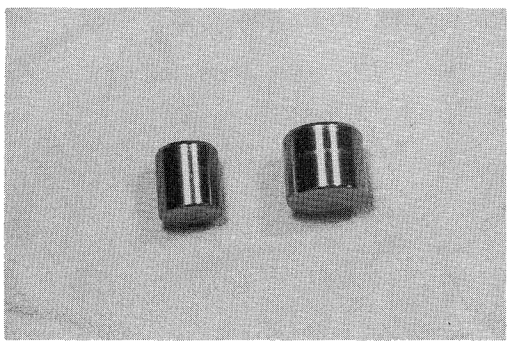
CALIPER

Inspect the caliper bore wall for nicks, scratches or other damage.



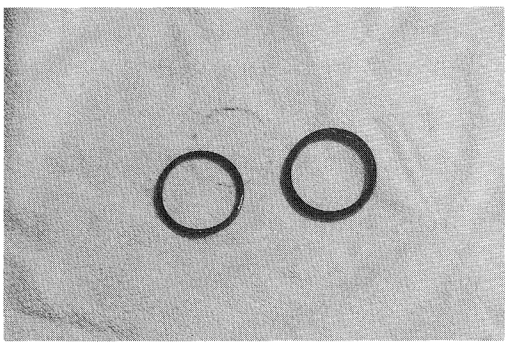
PISTON

Inspect the piston surface for any scratches or other damage.



RUBBER PARTS

Inspect each rubber part for damage and wear.

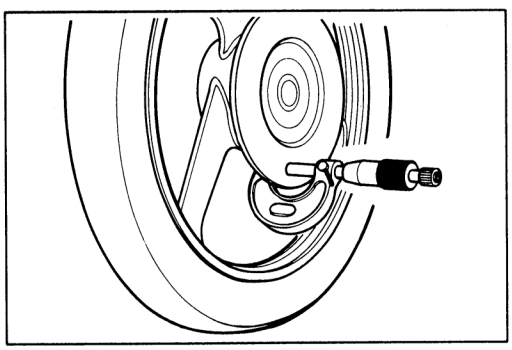


DISC

Using a micrometer, check the disc for wear, its thickness can be checked with disc and wheel in place. The service limits for the thickness of the discs are shown below.

09900-20205 : Micrometer (0 — 25 mm)

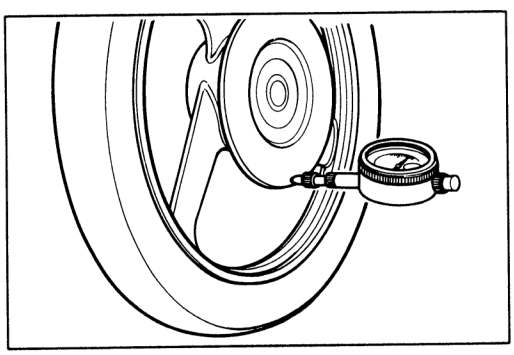
Service limit (Front) : 4.0 mm (0.15 in)
(Rear) : 5.5 mm (0.22 in)



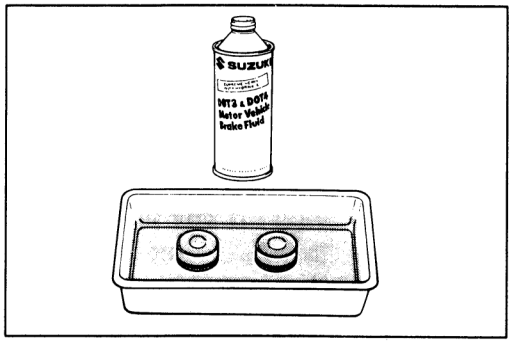
With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

09900-20606 : Dial gauge (1/100 mm)
09900-20701 : Magnetic stand (Not available in U.S.A.)

Service limit : 0.30 mm (0.012 in)



CALIPER REASSEMBLY AND REMOUNTING



Reassemble and remount the caliper in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

* **Wash the caliper components with fresh brake fluid before reassembly.**
* **Never use cleaning solvent or gasoline to wash them.**
* **Apply brake fluid to the caliper bore and piston to be inserted into the bore.**

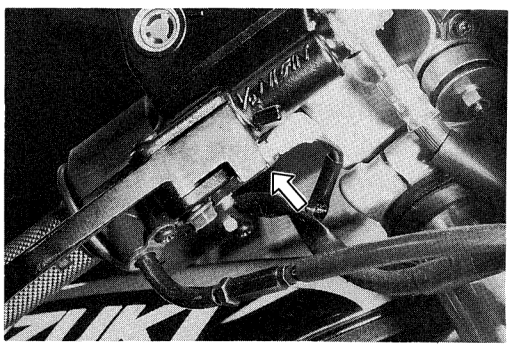
CALIPER BOLTS

Tighten the bolts to the specified torque.
(Refer to page 6-7.)

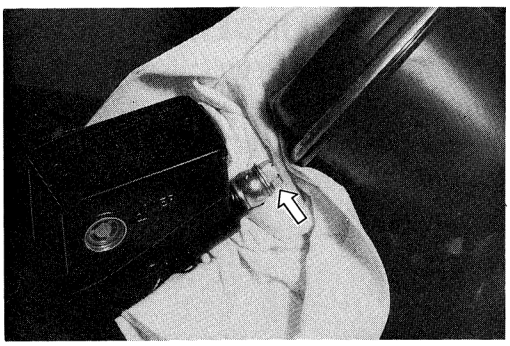
CAUTION:

Bleed air after reassembling the caliper. (Refer to page 2-16.)

MASTER CYLINDER REMOVAL AND DISASSEMBLY



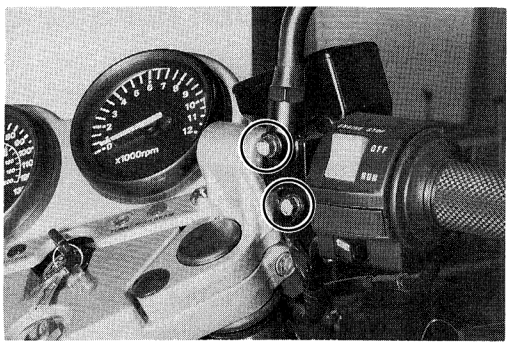
- Remove the front brake light switch.



- Place a rag underneath the union bolt on the master cylinder to catch the spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

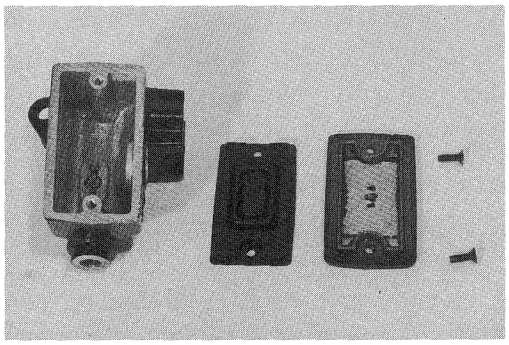
CAUTION:

Completely wipe off any brake fluid adhering to any parts of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc.



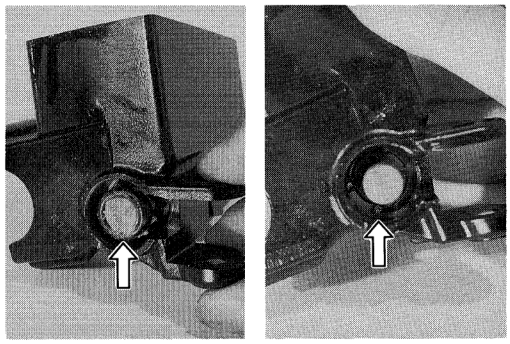
- Remove the master cylinder assembly.

- Remove the front brake lever, reservoir cap and diaphragm.
- Drain brake fluid.

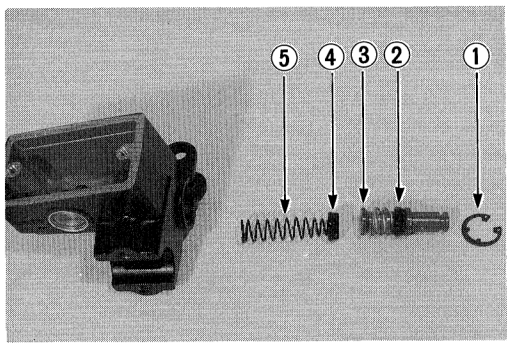


- Remove the dust seal, then remove the circlip by using the special tool.

09900-06108 : Snap ring pliers

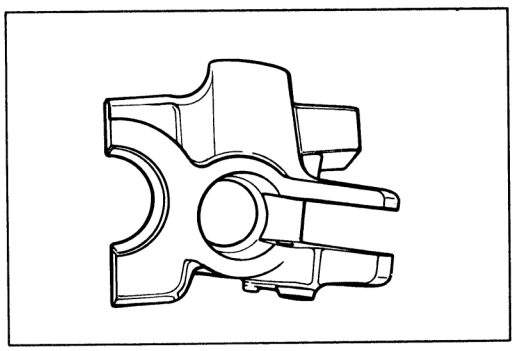


- Remove the piston/secondary cup, primary cup and spring.
  ① Circlip
  ② Secondary cup
  ③ Piston
  ④ Primary cup
  ⑤ Return spring



MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal for wear or damage.

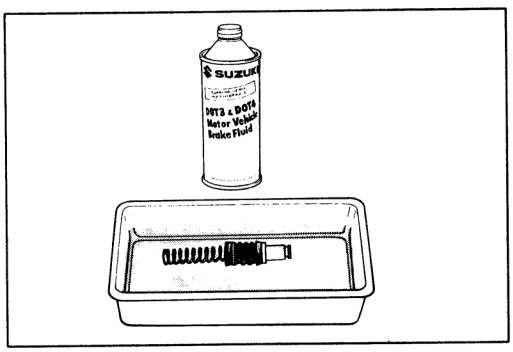


MASTER CYLINDER REASSEMBLY AND REMOUNTING

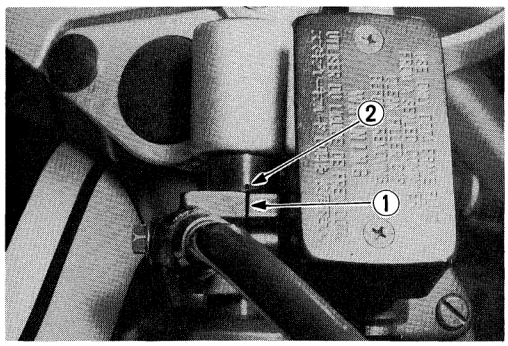
Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

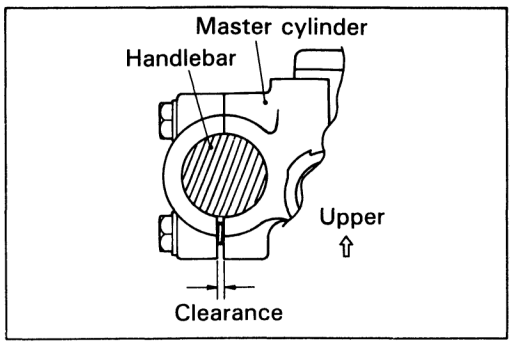


- When remounting the master cylinder on the handebar, align the master cylinder holder mating surface ① with punched mark ② on the handlebar, and first tighten the upper clamp bolt as shown.

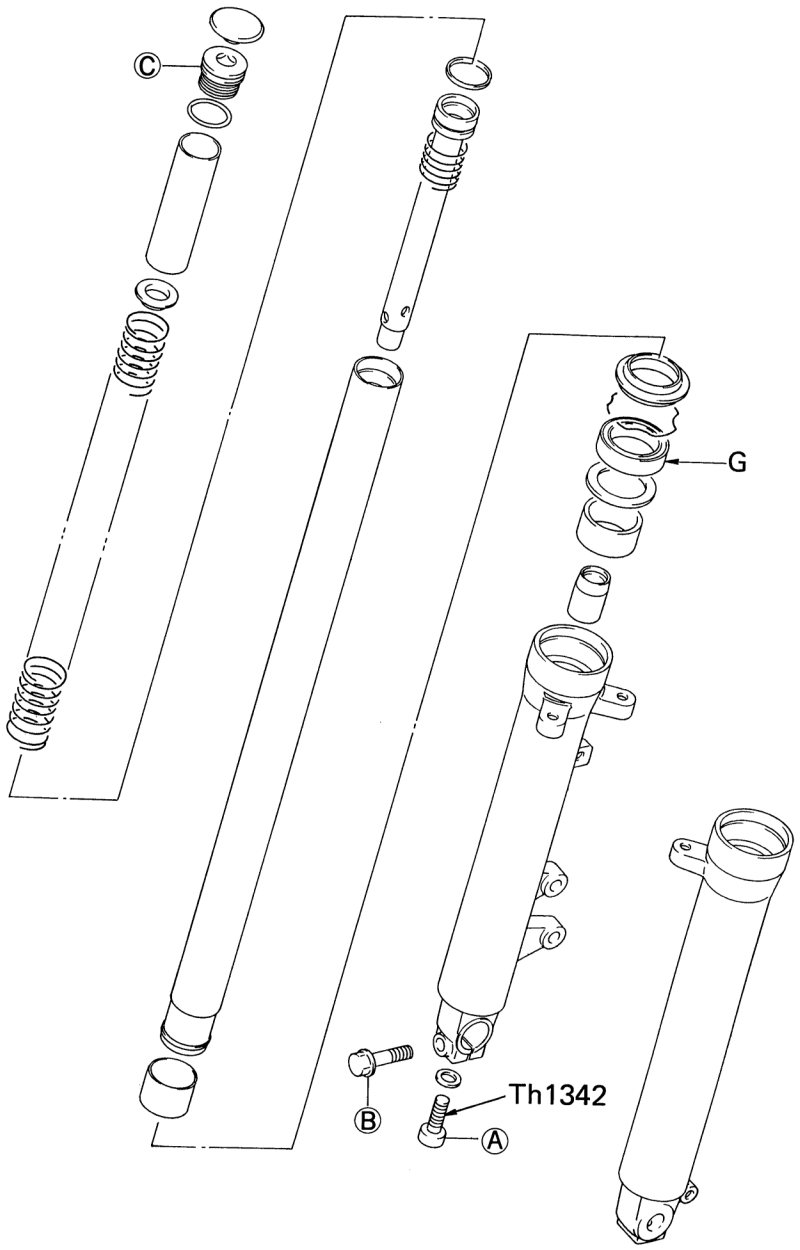


Tightening torque : 8.0 – 12.0 N·m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

CAUTION:
Bleed air after reassembling master cylinder. (Refer to page 2-16.)
Adjust the front brake light switch after installation.



FRONT FORK



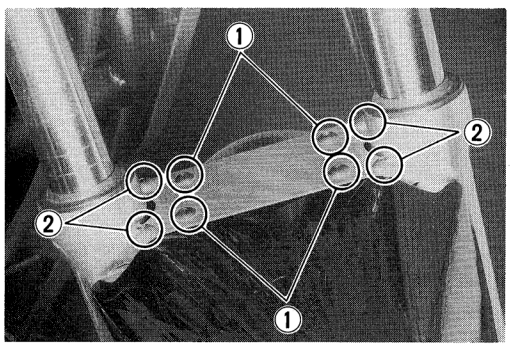
Tightening torque
Ⓐ : 15 – 25 N·m (1.5 – 2.5 kg-m, 11.0 – 18.0 lb-ft)
Ⓑ : 18 – 28 N·m (1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)
Ⓒ : 15 – 30 N·m (1.5 – 3.0 kg-m, 11.0 – 21.5 lb-ft)

G : Apply SUPER GREASE "A"
Th1342 : Apply THREAD LOCK "1342"

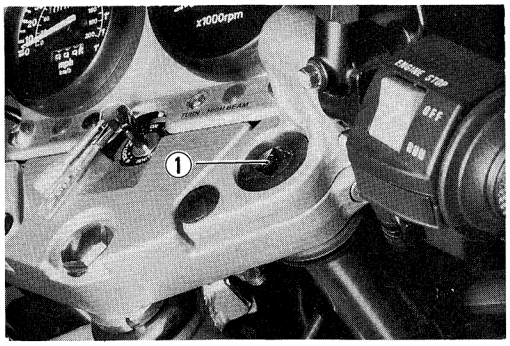
REMOVAL

- Remove the front wheel. (Refer to page 6-1.)
- Remove the front fender by removing four screws ①.
- Remove the front fender brace by removing four screws ②.

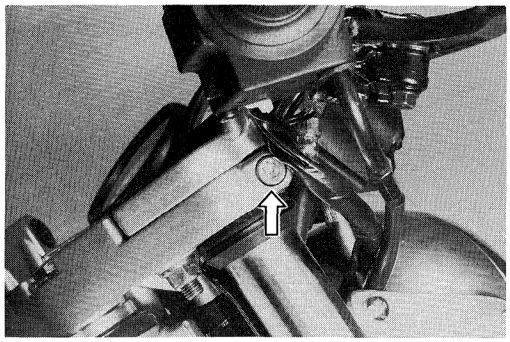
09900-00401 : L-type hexagon wrench



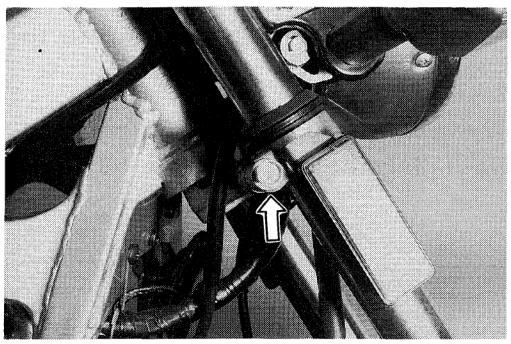
NOTE:
Slightly loosen the front fork cap bolt ① to facilitate later disassembly before loosening the front fork clamp bolt.



- Loosen the front fork upper clamp bolt.

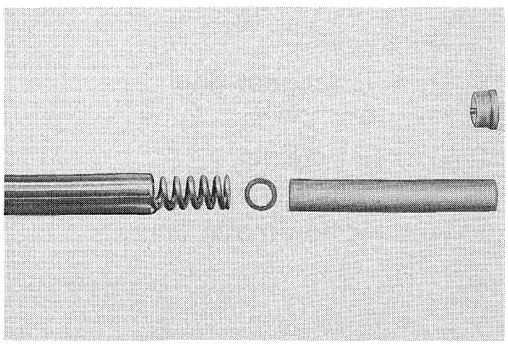


- Loosen the front fork lower clamp bolt and pull down the front fork.

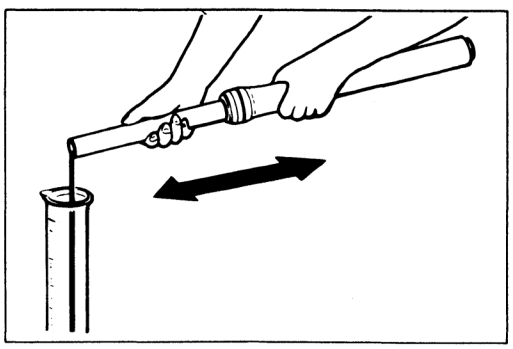


DISASSEMBLY

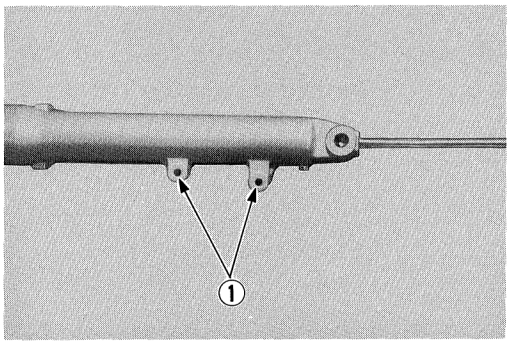
- Remove the front fork cap bolt.
- Remove the spacer, spring seat and spring out of the inner tube.



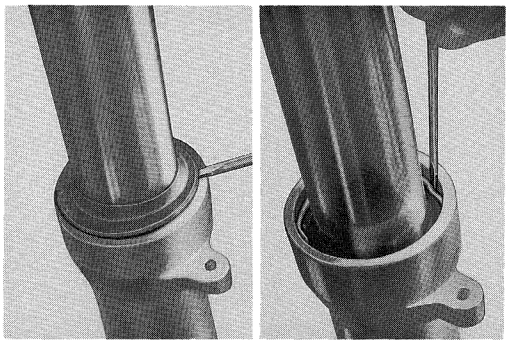
- Invert the fork and stroke it several times to let out fork oil.
- Hold the fork inverted for a few-minutes to drain oil.



- While holding the caliper mounting portion ① by vise and remove the damper rod bolt.

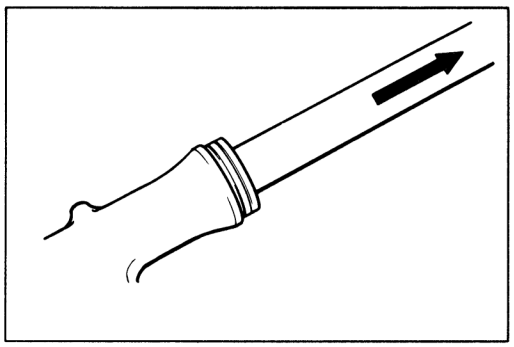


- Remove the dust seal and oil seal stopper ring.

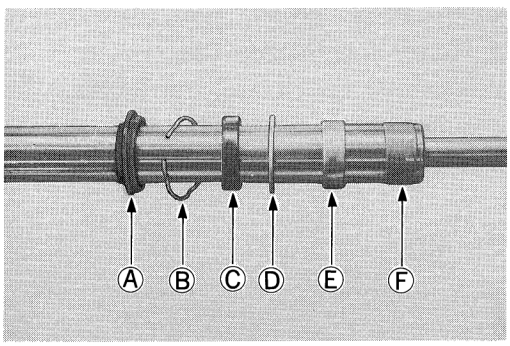


- Separate the inner tube out of the outer tube.

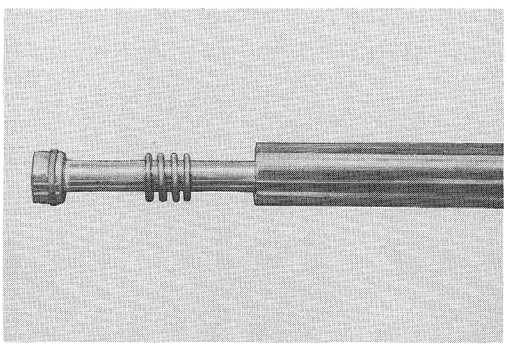
CAUTION:
The outer tube and inner tube "anti-friction " metals must be replaced along with the oil seal and dust seal.



Ⓐ Dust seal
Ⓑ Oil seal stopper ring
Ⓒ Oil seal
Ⓓ Oil seal retainer
Ⓔ Anti-friction metal (Outer)
Ⓕ Anti-friction metal (Inner)



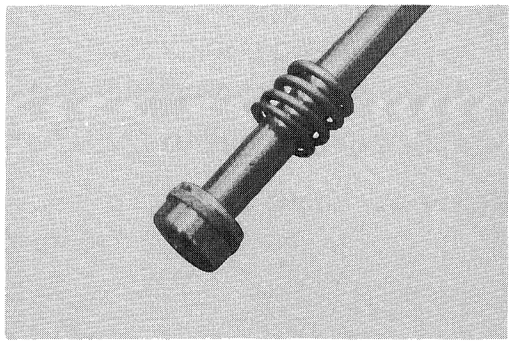
- Remove the damper rod and rebound spring out of the inner tube.



INSPECTION

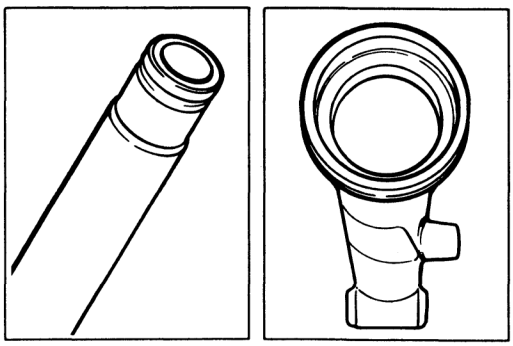
DAMPER ROD RING

Inspect the damper rod ring for wear or damage.



INNER AND OUTER TUBE

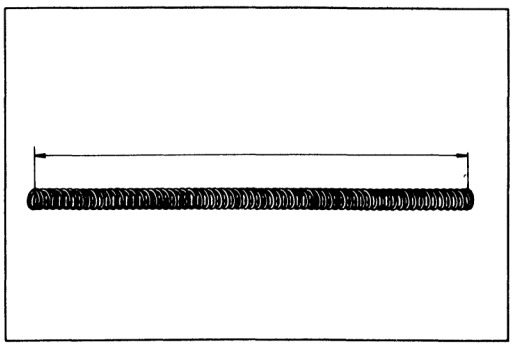
Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing.



FORK SPRING

Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

Service limit : 254 mm (10.0 in)

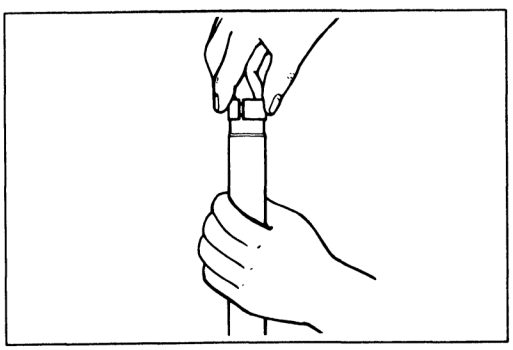


REASSEMBLY AND REMOUNTING

Reassemble and remount the front fork in the reverse order of removal and disassembly. Pay attention to the following points:

INNER TUBE METAL

- Hold the inner tube vertically and clean the metal groove and install the metal by hand as shown.



CAUTION:

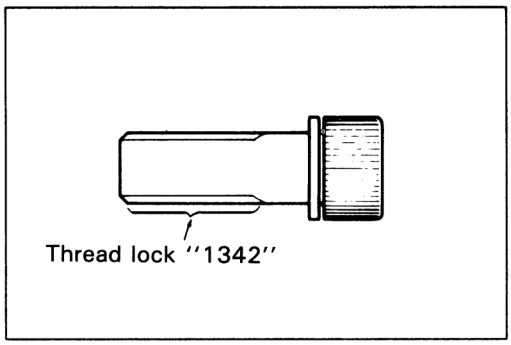
Use special care to prevent damage to the "Teflon" coated surface of the Anti-friction metal when mounting it.

DAMPER ROD BOLT

- Apply THREAD LOCK "1342" to the damper rod bolt and tighten it to the specified torque.

99000-32050 : THREAD LOCK "1342"

Tightening torque : 15 — 25 N·m
(1.5 — 2.5 kg-m, 11.0 — 18.0 lb-ft)

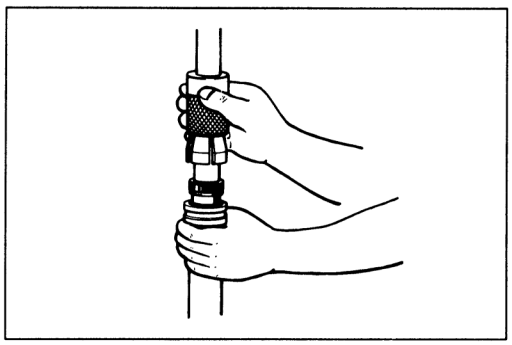


OUTER TUBE METAL, OIL SEAL AND DUST SEAL

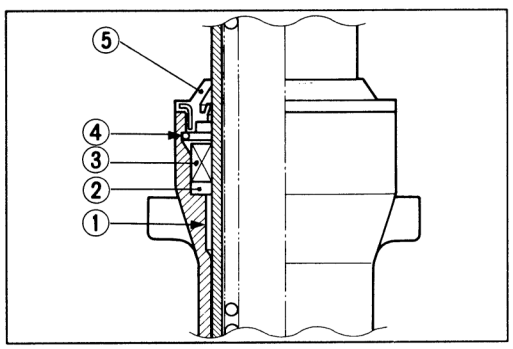
- Clean the metal groove of outer tube and metal outer surface.
- Install the outer tube metal, oil seal retainer and oil seal.

09940-50112 : Front fork oil seal installer

CAUTION:
Use special care to prevent damage to the "Teflon" coated surface of the Anti-Friction metal when installing it.



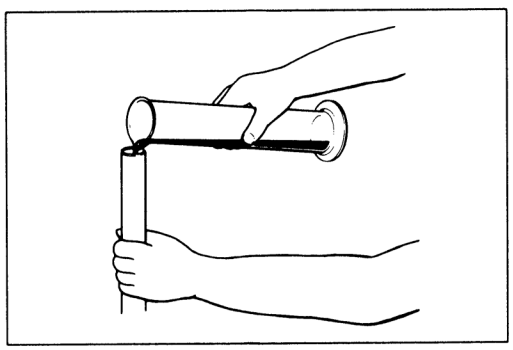
- After installing the oil seal, install the oil stopper ring and dust seal.
  ① Anti-friction metal
  ② Oil seal retainer
  ③ Oil seal
  ④ Oil seal stopper ring
  ⑤ Dust seal



FORK OIL

- Use fork oil whose viscosity rating meets specifications below.

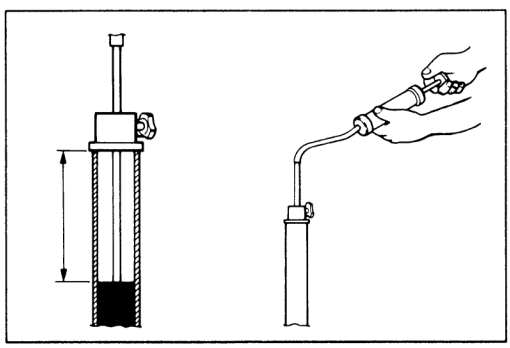
Fork oil type : Fork oil #10
Capacity (each leg) : 382 ml (12.9/13.5 US/Imp oz)



- Hold the front fork vertically and adjust the fork oil level with the special tool.

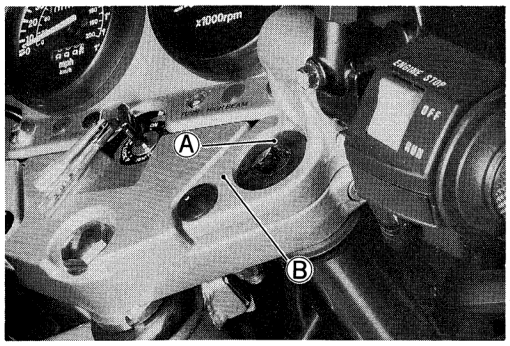
NOTE:
When adjusting oil level, remove the fork springs and compress the inner tube fully.

09943-74111 : Fork oil level gauge
Oil level : 99 mm (3.9 in)



INNER TUBE

- When installing the front fork assembly, align the upper surface Ⓐ of inner tube with the upper surface Ⓑ of the handlebar holder.



CLAMP BOLTS AND NUTS

- Tighten the upper and lower clamp bolts and handlebar mounting bolts and nuts to the specified torque.

09900-00410 : Hexagon wrench set

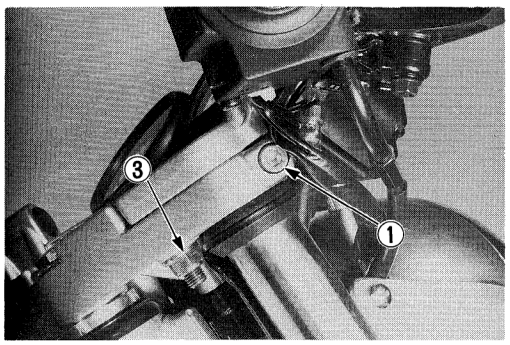
TIGHTENING TORQUE

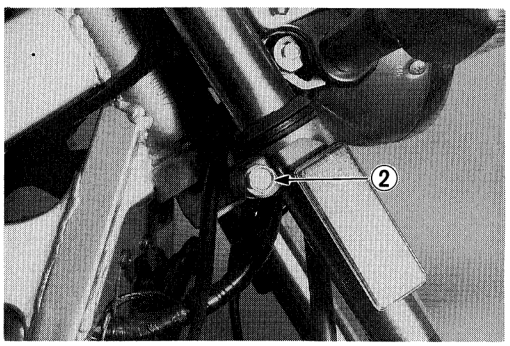
① **(Front fork upper clamp bolt) :**
18 – 28 N·m (1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

② **(Front fork lower clamp bolt) :**
25 – 40 N·m (2.5 – 4.0 kg-m, 18.0 – 29.0 lb-ft)

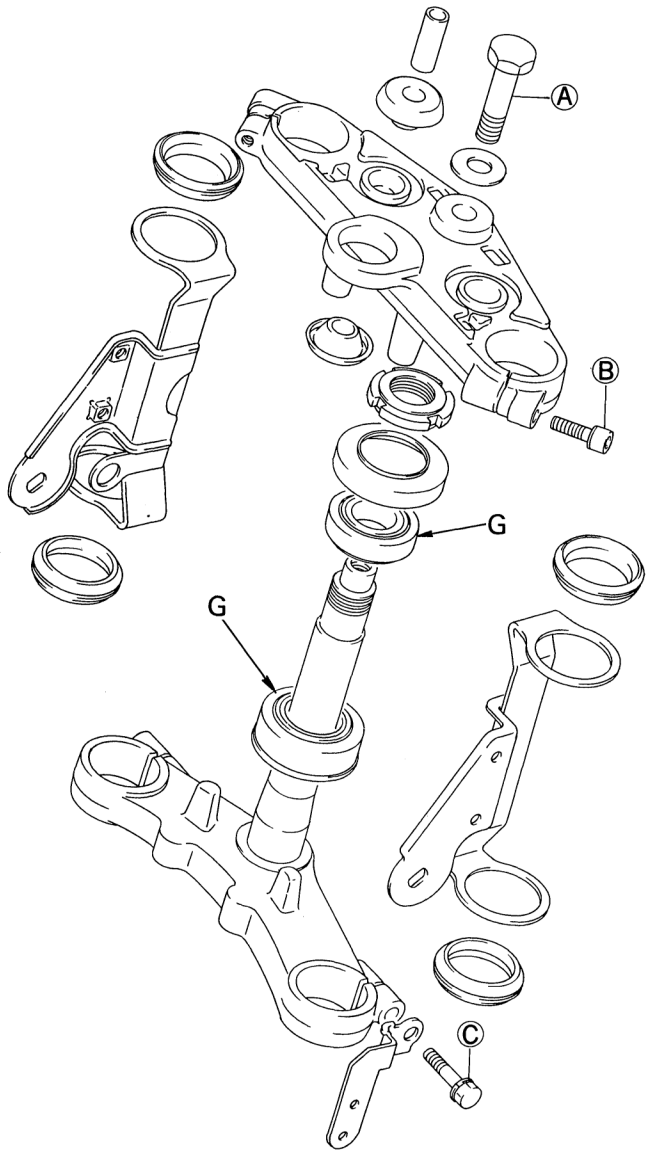
③ **(Handlebar holder mounting nut) :**
27 – 42 N·m (2.7 – 4.2 kg-m, 19.5 – 30.5 lb-ft)

NOTE:
Before tightening the front fender brace mounting screws, move the front fork up and down 4 or 5 times.





STEERING

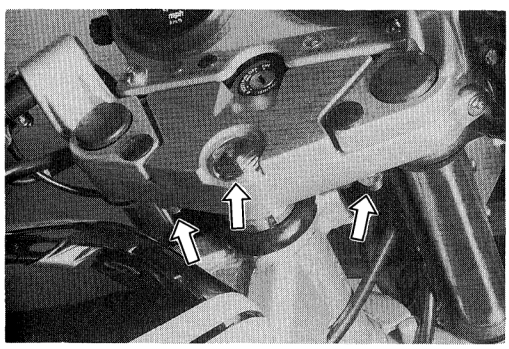


G : Apply SUPER GREASE "A"

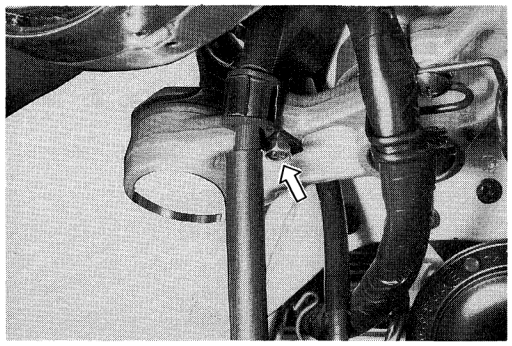
Tightening torque
Ⓐ : 35 – 55 N·m
(3.5 – 5.5 kg-m, 25.5 – 40.0 lb-ft)
Ⓑ : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)
Ⓒ : 25 – 40 N·m
(2.5 – 4.0 kg-m, 18.0 – 29.0 lb-ft)

REMOVAL

- Remove the front wheel. (Refer to page 6-1.)
- Remove the front forks. (Refer to page 6-13.)
- Disconnect the tachometer cable and speedometer cable.
- Remove the headlight and disconnect the lead wires in the headlight housing.
- Remove the tachometer and speedometer.
- Remove the left and right handlebars along with the handlebar holder by removing the handlebar holder mounting bolts and nuts.
- Remove the steering stem head bolt.
- Remove the steering stem head by disconnecting the ignition switch lead wire coupler.



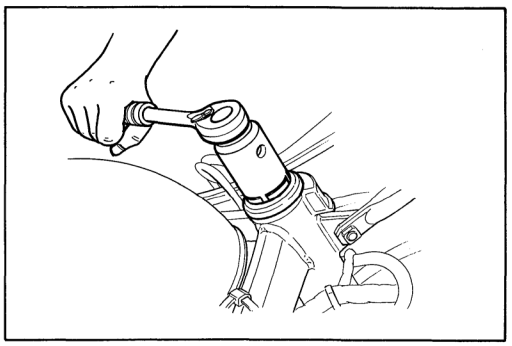
- Remove the brake hose clamp.



- Remove the steering stem nut by using the special tool, then remove the steering stem lower bracket.

09940-14911 : Steering stem nut wrench

NOTE:
Hold the steering stem lower bracket by hand to prevent it from falling.

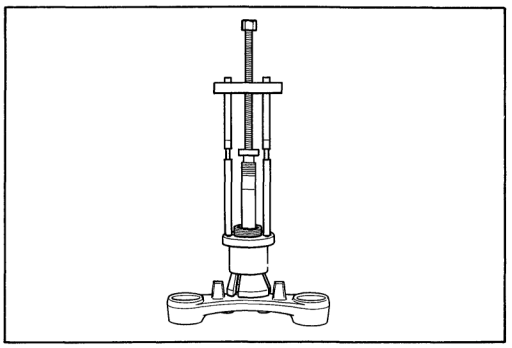


DISASSEMBLY

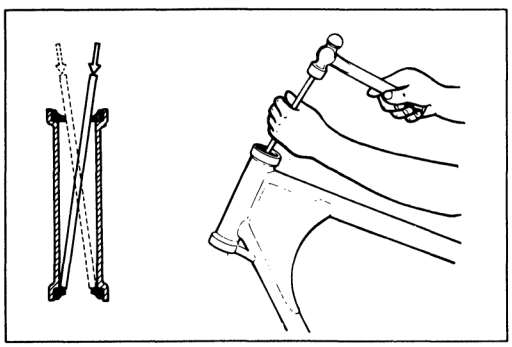
- Draw out the steering stem lower bearing by using the special tools.

09941-84510 : Bearing remover

CAUTION:
The removed bearing should be replaced.



- Drive out the steering stem bearing races, upper and lower, by using the appropriate drift.



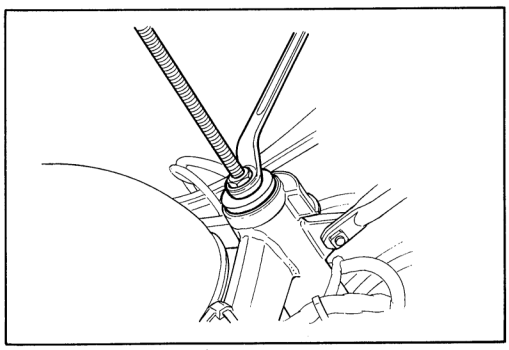
INSPECTION

Inspect the removed parts for the following abnormalities.

* Handlebar distortion
* Race wear and brinelling
* Bearing wear or damage
* Abnormal noise of bearing
* Distortion of steering stem

REASSEMBLY AND REMOUNTING

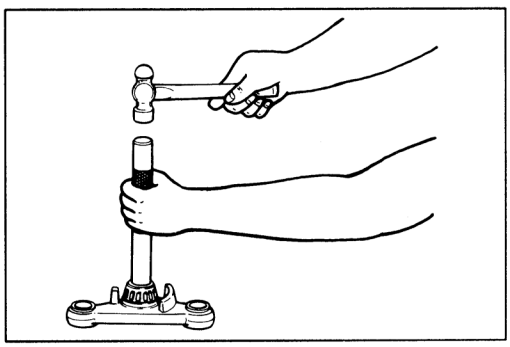
Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:



OUTER RACES

- Press in the upper and lower outer races by using the special tool.

09941-34513 : Steering outer race installer

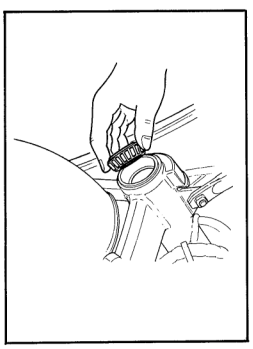


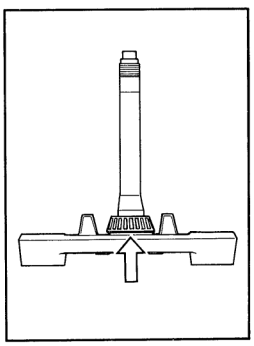
BEARING

- Place a washer on the bearing and press in the lower bearing by using the special tool.

09941-74910 : Steering bearing installer

- Apply grease to the upper and lower bearings before remounting the steering stem.





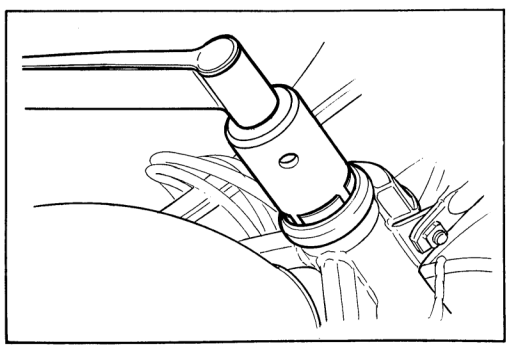
(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

STEM NUT

- Tighten the steering stem nut to the specified torque.

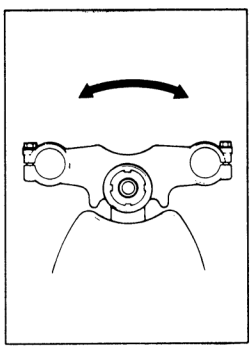
09940-14911 : Steering stem nut wrench

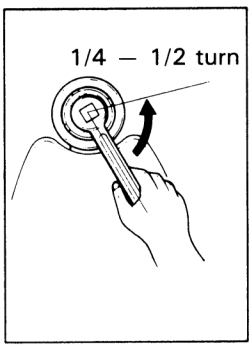
Tightening torque : 40 — 50 N·m
(4.0 — 5.0 kg-m, 29.0 — 36.0 lb-ft)



- Turn the steering stem lower bracket about five or six times to the left and right so that the taper roller bearing will be seated properly.
- Turn back the stem nut by 1/4 — 1/2 turn.

NOTE:
This adjustment will vary from motorcycle to motorcycle.

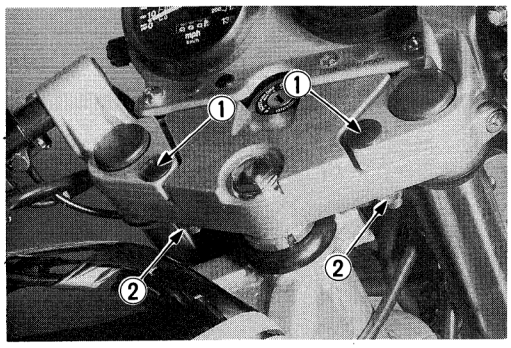




HANDLEBAR HOLDER

- Tighten the handlebar holder set bolt and nut to the specified torque.

Tightening torque
Bolt ① and Nut ② : 27 — 42 N·m
(2.7 — 4.2 kg-m, 19.5 — 30.5 lb-ft)

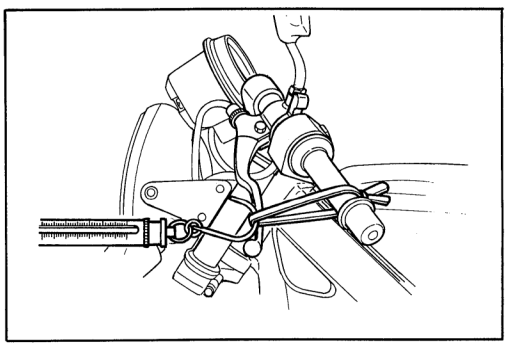


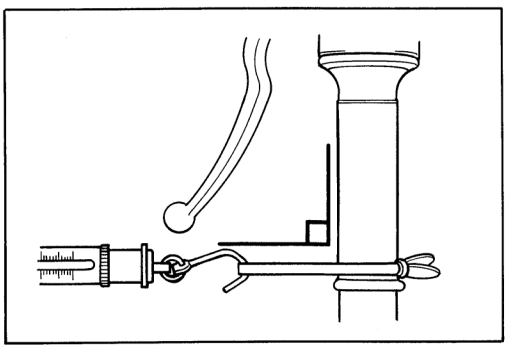
STEERING TENSION ADJUSTMENT

Check the steering movement in the following procedure.

- By using jacks at two (right and left) positions on the frame down tubes (lower straight portions), lift the front wheel until it is off the floor by 20 to 30 mm.
- Check to make sure that the cables and wire harnesses are properly routed.
- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.

Initial force : 200 — 500 grams
09940-92710 : Spring scale

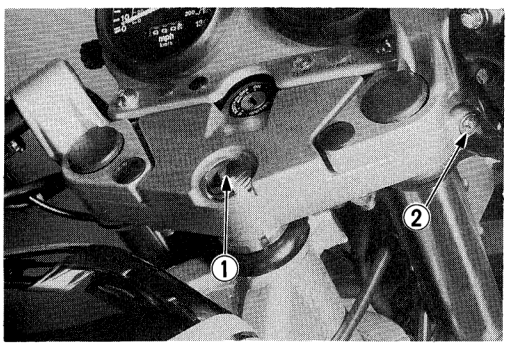




- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
  1) First, loosen the front fork upper clamp bolts and steering stem head bolt, and then adjust the steering stem nut by loosening or tightening it.
  2) Tighten the head bolt and clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.

Tightening torque
Stem head bolt ① : 35 — 55 N·m
(3.5 — 5.5 kg-m, 25.5 — 40.0 lb-ft)

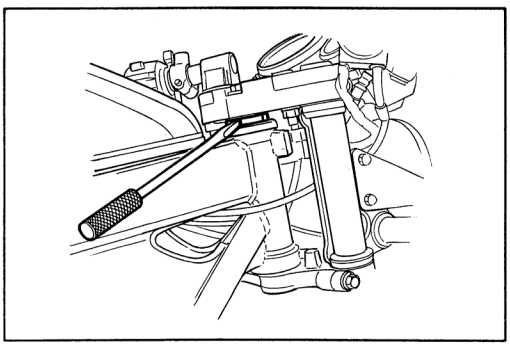
Front fork
Upper clamp bolt ② : 18 — 28 N·m
(1.8 — 2.8 kg-m, 13.0 — 20.0 lb-ft)



  3) If the initial force is found within the specified range, adjustment has been completed.

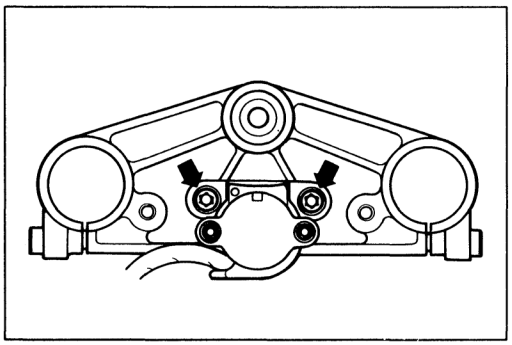
NOTE:
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

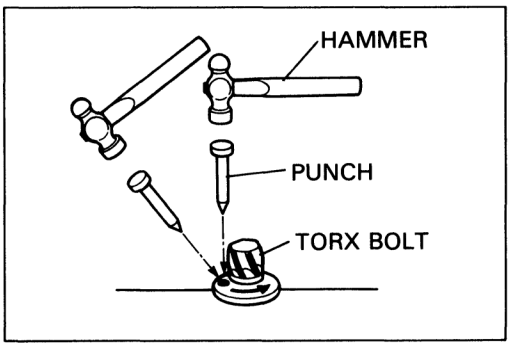
- Lower the jacks.



IGNITION SWITCH

- To remove the ignition switch, remove the bolt to detach the ignition switch from the steering stem upper bracket by using a center punch and hummer.



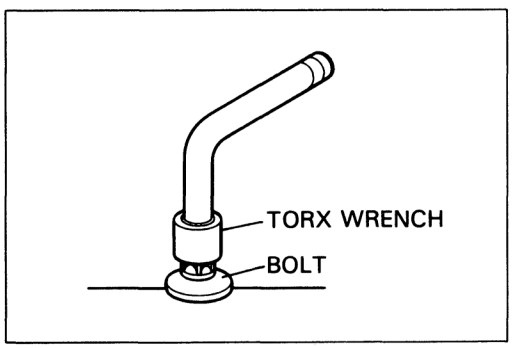


- To install the ignition switch, always use the new special bolt and follow the procedures below.

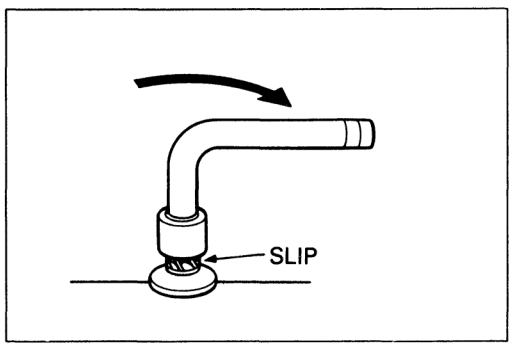
NOTE:
The spare ignition switch comes equipped with the special bolts, however, the bolt is also individually available as spare parts.

- Using the special bolts, attach the ignition switch on the steering stem upper bracket in place and run in the bolts with the special tool.

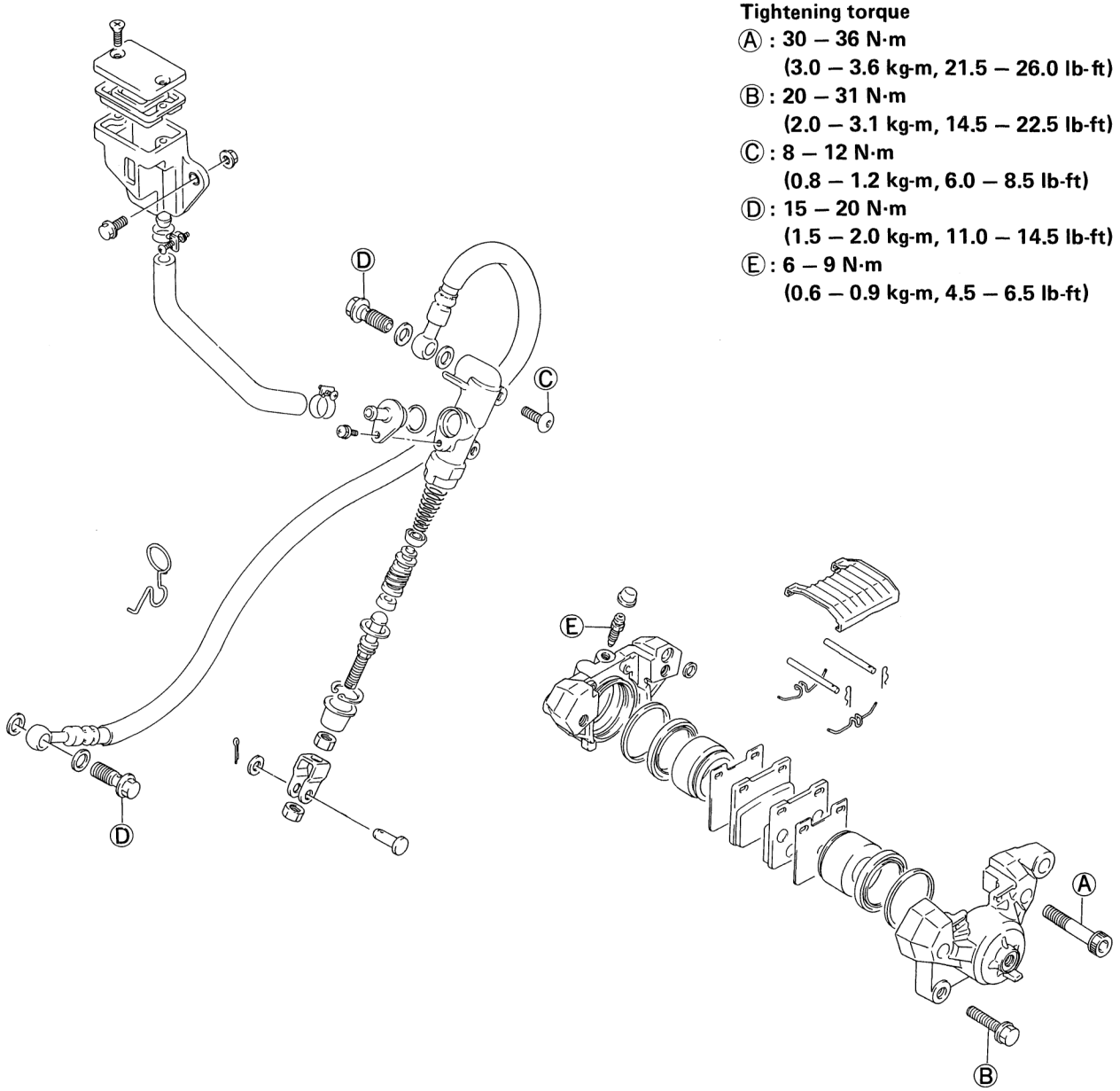
09930-11910 : Torx wrench



- Continue turning the tool until the tool slips from the bolt head or the bolt head breaks off, then the bolt has become tightened to the proper specification.



REAR BRAKE



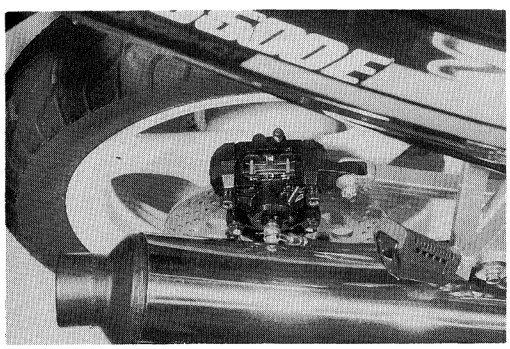
BRAKE PAD REPLACEMENT

- Remove the dust seal cover.
- Remove the clips, pins and springs.
- Remove the pads.

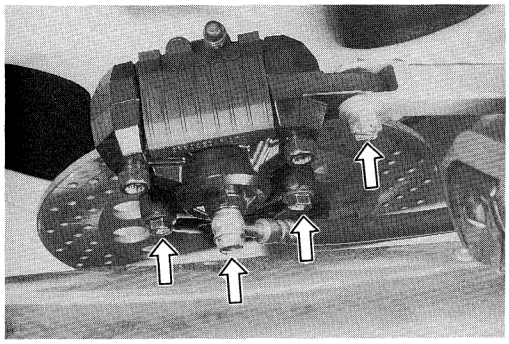
CAUTION:

* **Do not operate the brake pedal while dismounting the pads.**

* **Replace the brake pad as a set, otherwise braking performance will be adversely affected.**

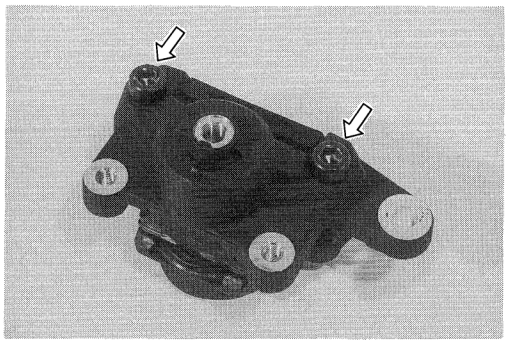


CALIPER REMOVAL AND DISASSEMBLY

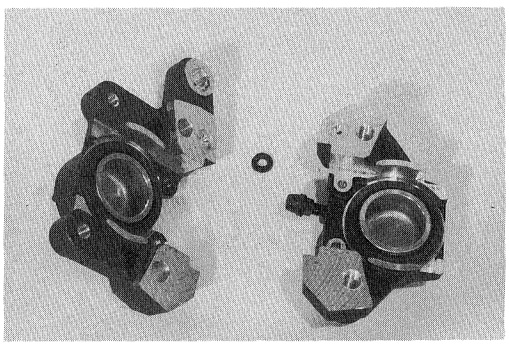


- Remove the union bolt and catch the brake fluid in a suitable receptacle.
- Remove the caliper mounting bolts.
- Remove the torque link bolt and nut, and take off the caliper.

NOTE:
Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.

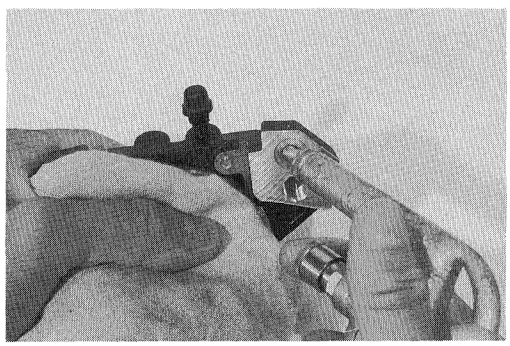


- Remove the pads. (Refer to page 6-24.)
- Remove the caliper housing bolts and separate the caliper halves.



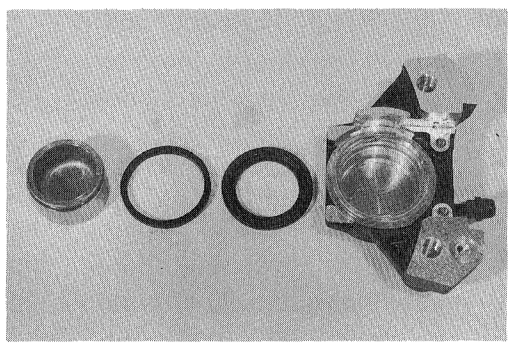
- Remove the O-ring.

NOTE:
Once separate the caliper halves, replace the O-ring with a new one.



- Place a rag over the piston to prevent it from popping out and push out the piston by using air gun.

CAUTION:
Do not use high pressure air to prevent piston damage.

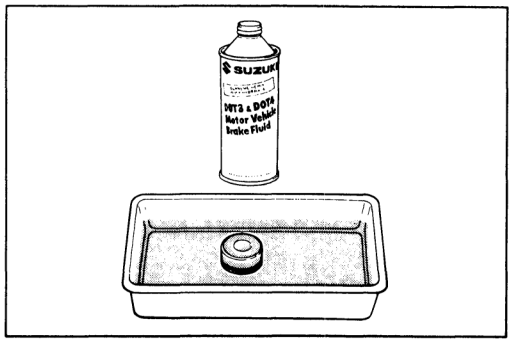


- Remove the dust seal, piston and piston seal out of the caliper.

CALIPER AND DISC INSPECTION

CALIPER ..... Refer to page 6-9.
PISTON ..... Refer to page 6-9.
RUBBER PARTS ..... Refer to page 6-9.
DISC ..... Refer to page 6-9.

CALIPER REASSEMBLY AND REMOUNTING



Reassemble and remount the caliper in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

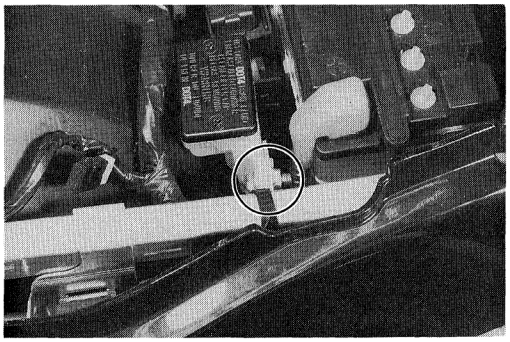
* **Wash the caliper components with fresh brake fluid before reassembly.**
* **Never use cleaning solvent or gasoline to wash them.**
* **Apply brake fluid to the caliper bore and piston to be inserted into the bore.**
* **Bleed air after reassembling the caliper. (Refer to page 2-16.)**

CALIPER BOLTS

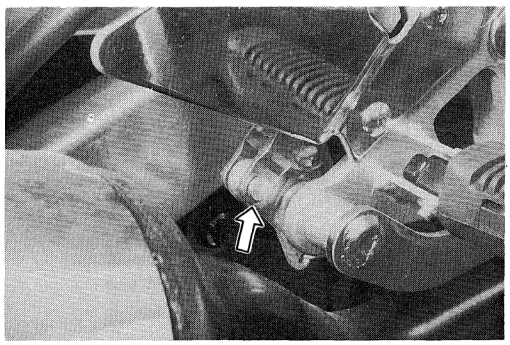
Tighten the bolts to the specified torque.
(Refer to page 6-24.)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

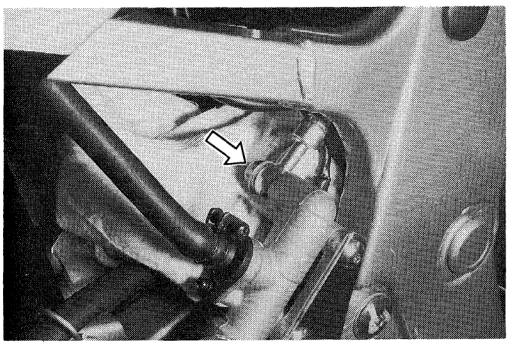
- Remove the seat.
- Remove the reservoir tank mounting bolt.



- Pull out cotter pin and remove the push rod pin.



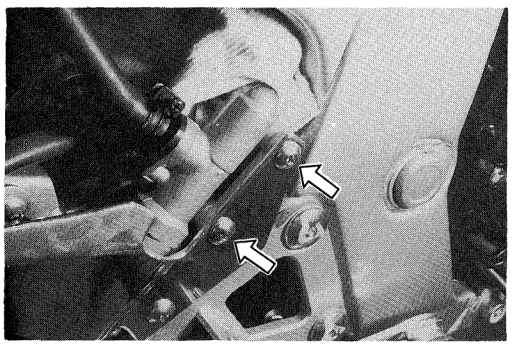
- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose from the master cylinder joint.



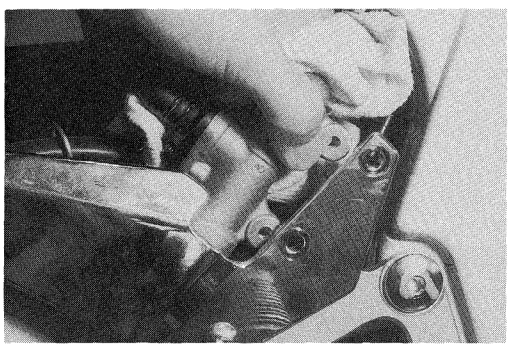
CAUTION:
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

- Remove the master cylinder/footrest mounting bolts.

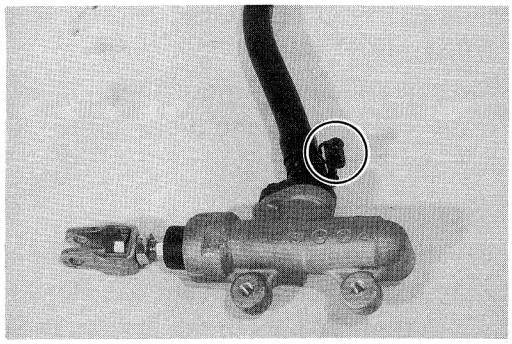
09900-00401 : L-type hexagon wrench



- Remove the master cylinder assembly.

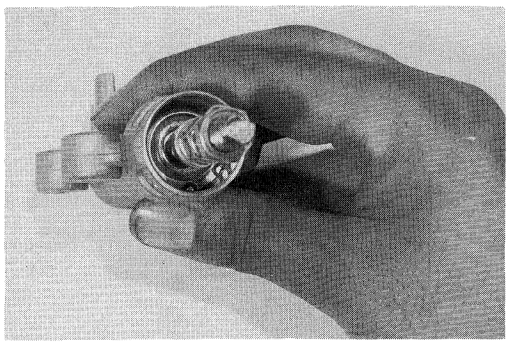


- Remove the reservoir tank hose.
- Remove the reservoir tank cap and drain brake fluid from the reservoir tank.

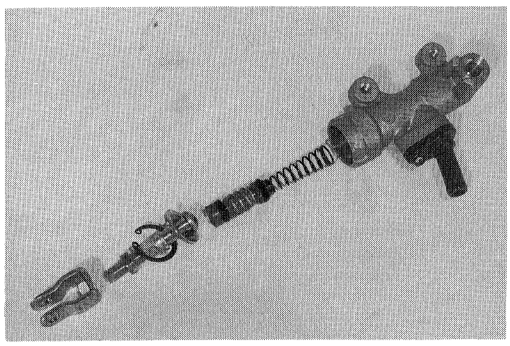


- Remove the dust seal, then remove the circlip by using the special tool.

09900-06105 : Snap ring pliers

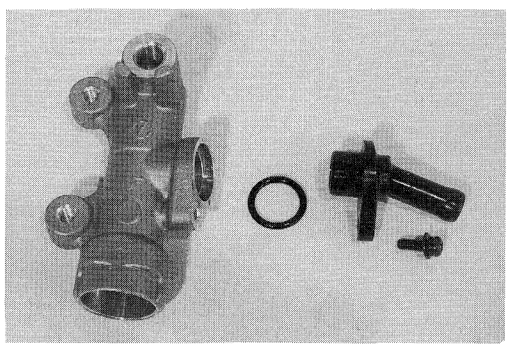


- Remove the push rod, piston, primary cup and spring.



- Remove the connector and O-ring.

CAUTION:
The removed O-ring should be replaced with new one.

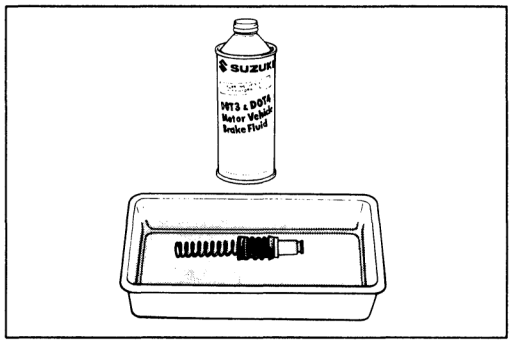


MASTER CYLINDER INSPECTION

CYLINDER, PISTON AND CUP SET

Inspect the cylinder bore wall for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the cup set and each rubber part for damage.

MASTER CYLINDER REASSEMBLY AND REMOUNTING



Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

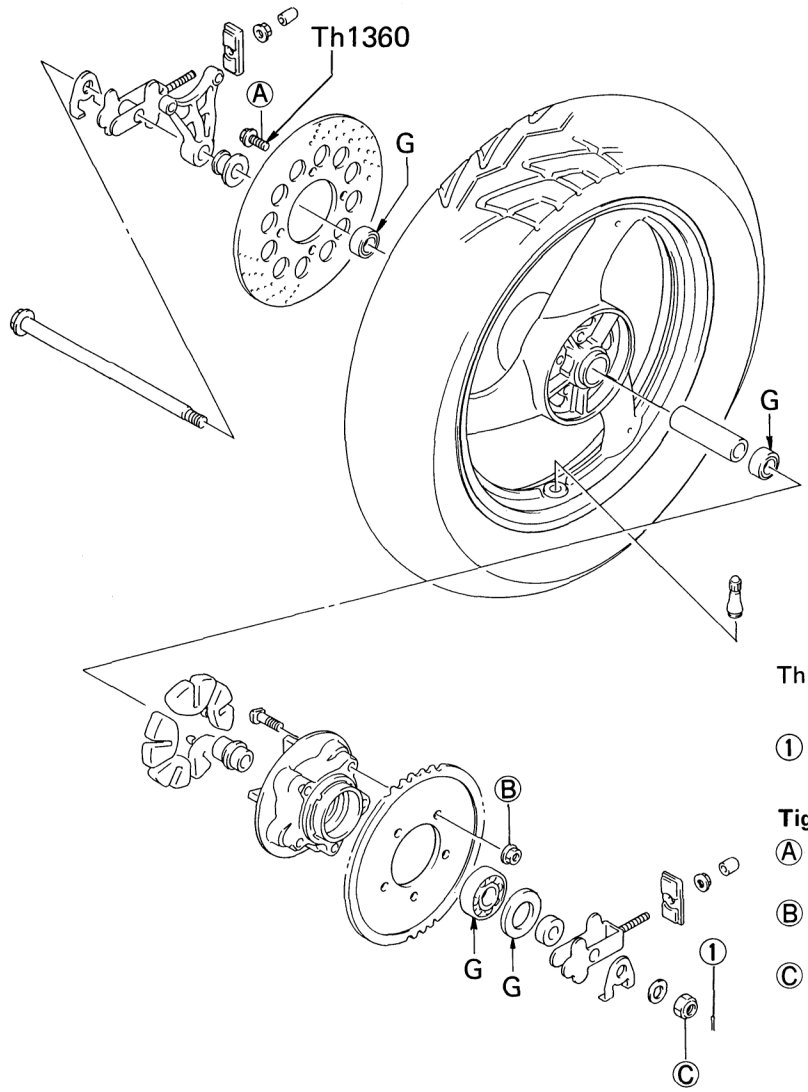
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

CAUTION:

Bleed air after reassembling master cylinder. (Refer to page 2-16.)

Adjust the rear brake light switch and brake pedal height after installation.(Refer to page 2-15.)

REAR WHEEL



Th1360 : Apply THREAD LOCK "1360"
G : Apply SUPER GREASE "A"

① Cotter pin (For E-03, 28 and 33 models)

Tightening torque

Ⓐ : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

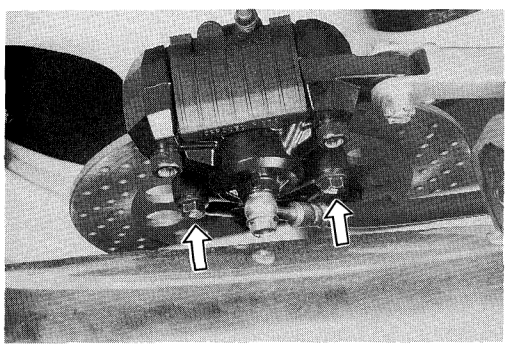
Ⓑ : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)

Ⓒ : 50 – 80 N·m ... Normal nut with cotter pin
(5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft)

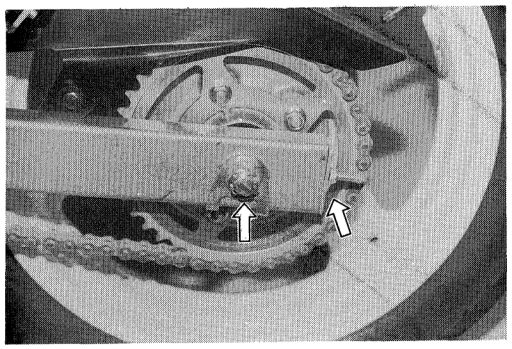
60 – 96 N·m ... Self-lock nut
(6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft)

REMOVAL

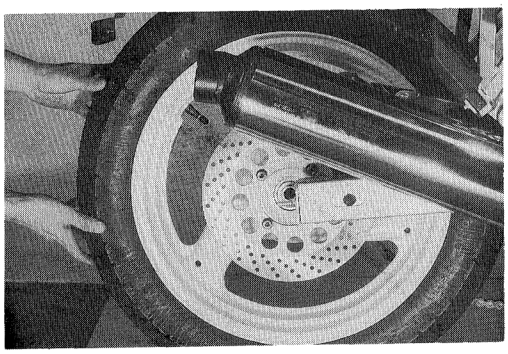
- Support the motorcycle by center stand.
- Remove the rear brake caliper mounting bolts and lift the caliper along with the torque link.



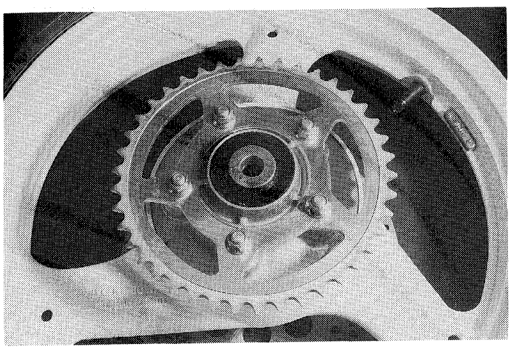
- Remove the cotter pin. (For E-03, 28 and 33 models)
- Remove the rear axle nut.
- Loosen the chain adjusting nuts, left and right.
- Draw out the axle shaft.



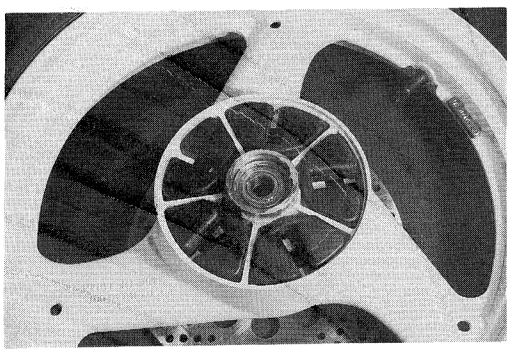
- Disengage the drive chain from the rear sprocket.
- Remove the rear wheel.



- Remove the rear sprocket along with its mounting drum off the wheel hub.

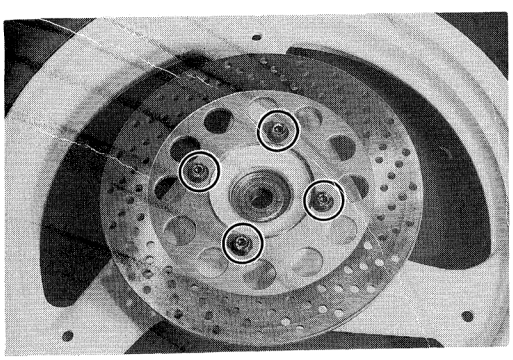


- Remove the five dampers out of the wheel hub.



- Remove the brake disc by removing the mounting bolts.

09900-00410 : Hexagon wrench set
(Not available in U.S.A.)

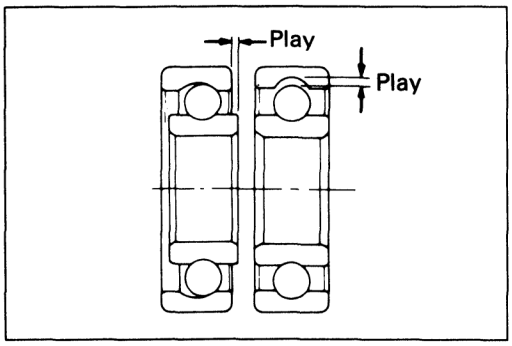


INSPECTION AND DISASSEMBLY

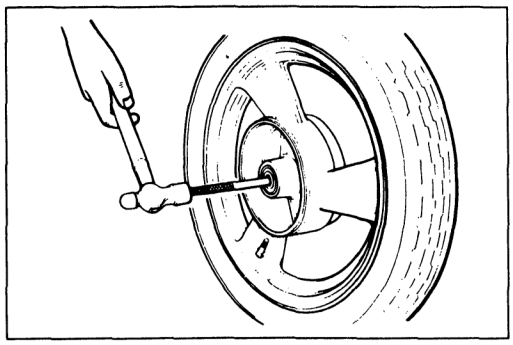
TIRE ..... Refer to page 6-36.

WHEEL AND SPROCKET DRUM BEARINGS

Inspect the play of respective bearings by hand while they are in the wheel and sprocket drum. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



- Drive out the wheel bearings and sprocket drum bearing by using a proper tool.



CAUTION:

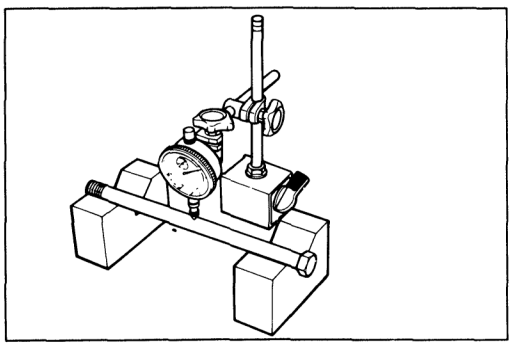
The removed bearings and oil seal should be replaced with new ones.

AXLE SHAFT

Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

09900-20606 : Dial gauge (1/100)
09900-20701 : Magnetic stand } **Not available in U.S.A**
09900-21304 : V-block set (100 mm) }

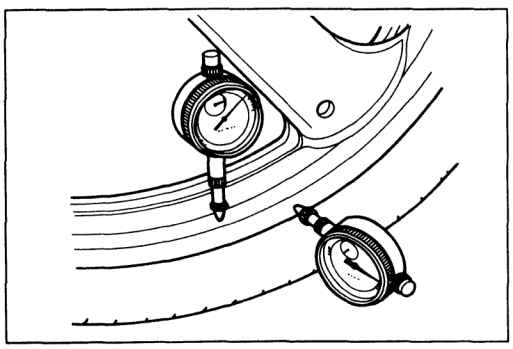
Service limit : 0.25 mm (0.010 in)



WHEEL

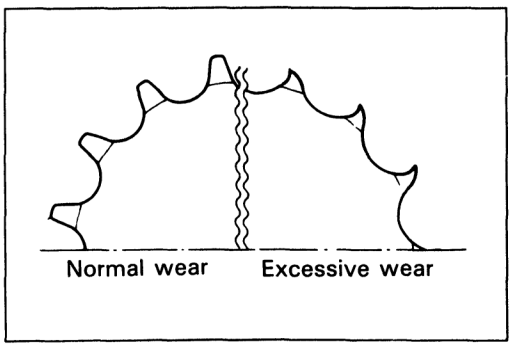
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service limit (Axial and Radial): 2.0 mm (0.08 in)

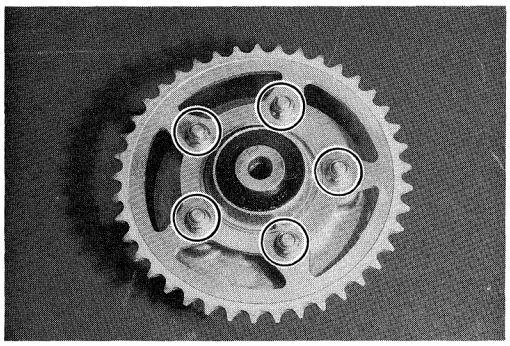


SPROCKET

Inspect the sprocket teeth for wear. If they are worn as illustrated, replace the sprocket and drive chain.

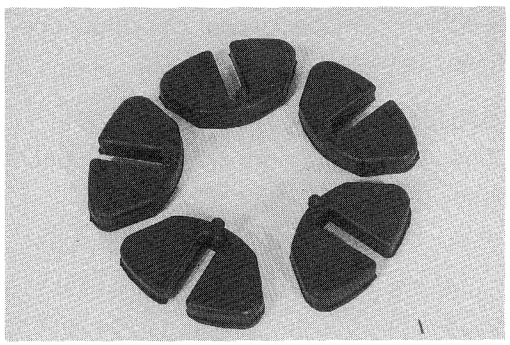


- Remove the rear sprocket by removing the mounting nuts.



DAMPER

Inspect the dampers for wear and damage.



REASSEMBLY AND REMOUNTING

Reassemble and remount the rear wheel in the reverse order of removal and disassembly. Pay attention to the following points:

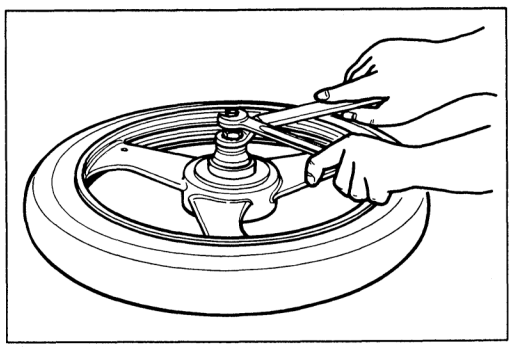
WHEEL BEARING

- Apply grease to the bearings before installing.

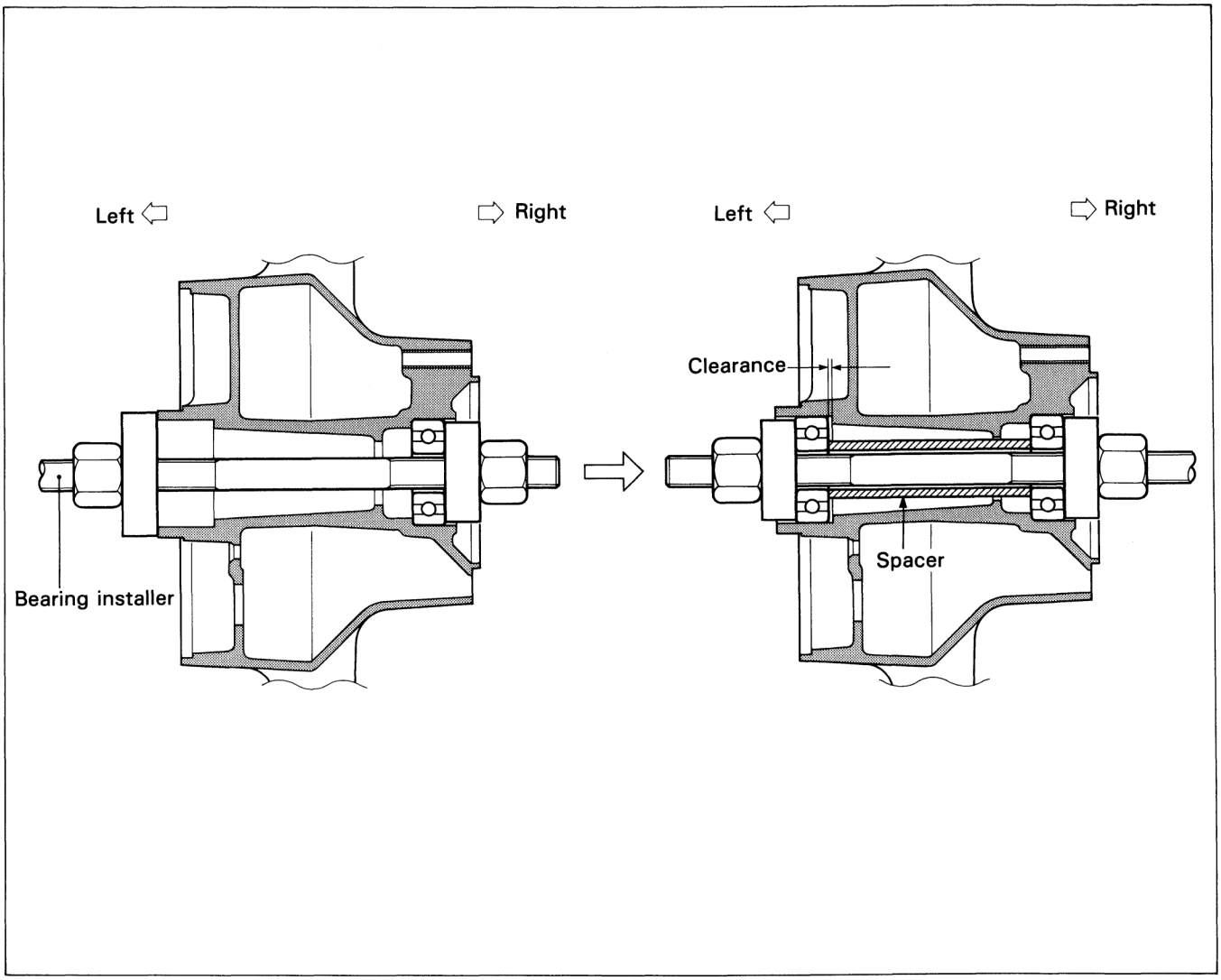
(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

- Install the wheel bearings by using the special tools.

09941-34513 : Bearing installer set



NOTE:
First install the right wheel bearing, then install the left wheel bearing. The sealed cover on the bearing is positioned outside.
Refer to next page.



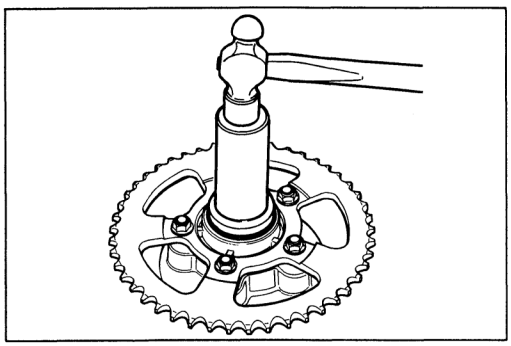
SPROCKET DRUM BEARING AND SPROCKET

- Install the bearing by using the special tool.

09913-75520 : Bearing installer

- Apply grease to the bearing and oil seal lip.

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

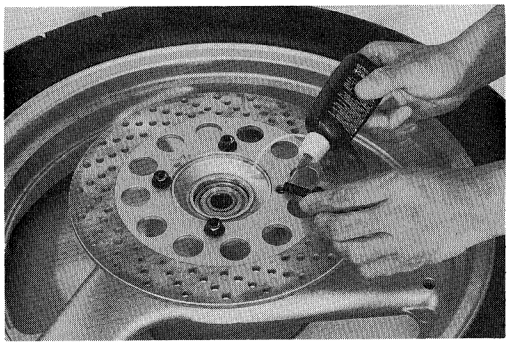


NOTE:
When installing the rear sprocket on its mounting drum, the stamped mark on the sprocket is positioned outside.

- Tighten the sprocket mounting nuts to the specified torque.

Tightening torque : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)

BRAKE DISC



- Make sure that the brake disc is clean and free of any greasy matter.
- Apply THREAD LOCK "1360" to the disc bolts and tighten them to the specified torque.

99000-32130 : THREAD LOCK "1360"
Tightening torque : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)

TIGHTENING TORQUE

Axle nut:
50 – 80 N·m (5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft) ... Normal nut with cotter pin
60 – 96 N·m (6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft) ... Self-lock nut

Brake caliper mounting bolt:
20 – 31 N·m (2.0 – 3.1 kg-m, 14.5 – 22.5 lb-ft)

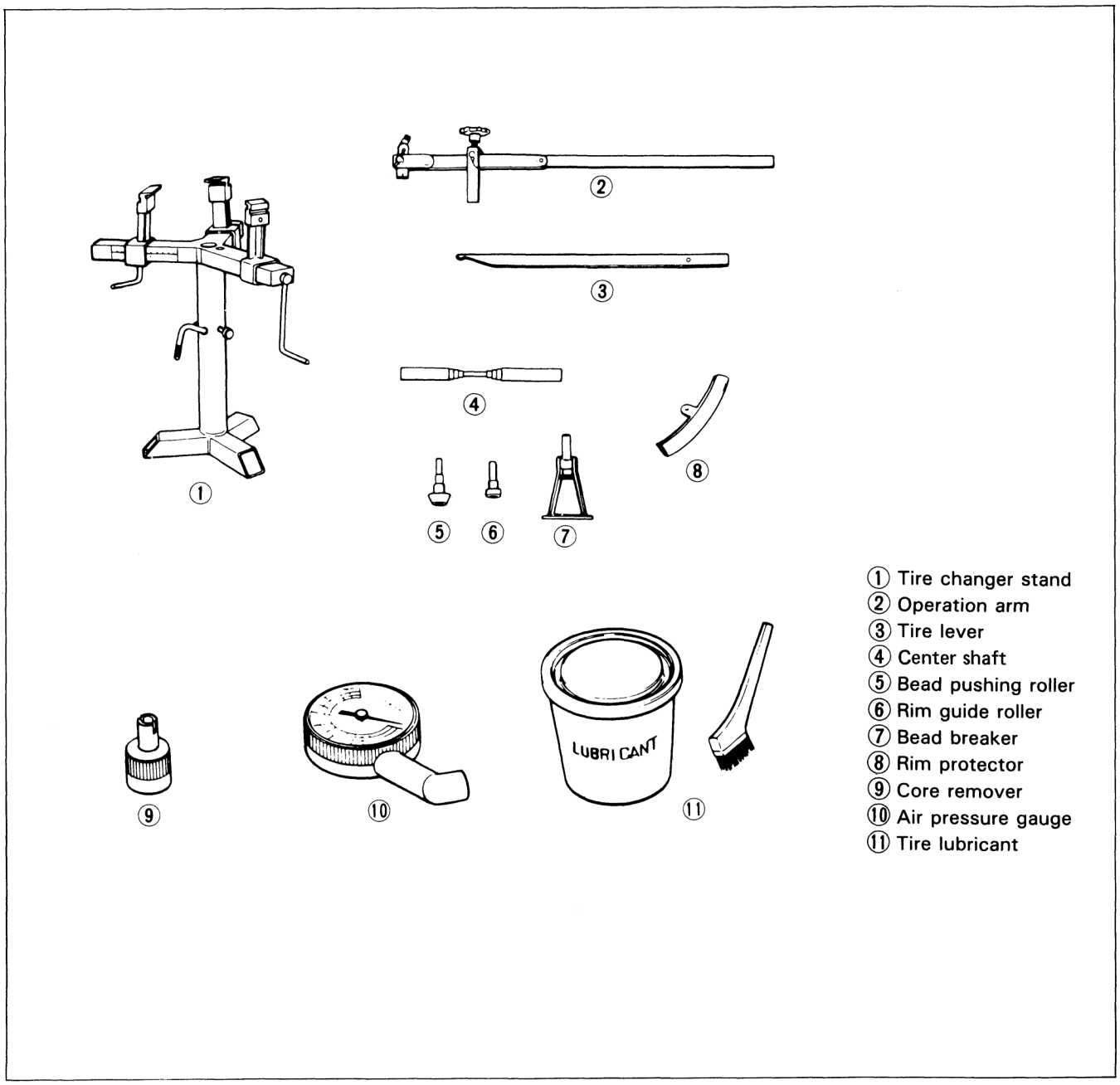
ADJUSTMENT

- Adjust the chain slack after rear wheel installation. (Page 2-13)

TIRE AND WHEEL

TIRE REMOVAL

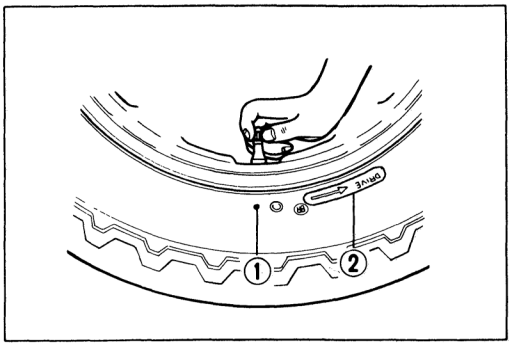
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers.
For tire removal the following tools are required.



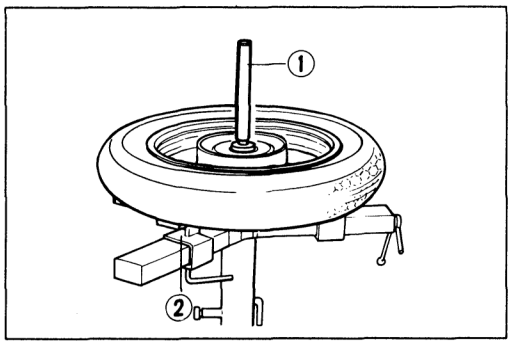
① Tire changer stand
② Operation arm
③ Tire lever
④ Center shaft
⑤ Bead pushing roller
⑥ Rim guide roller
⑦ Bead breaker
⑧ Rim protector
⑨ Core remover
⑩ Air pressure gauge
⑪ Tire lubricant

- Remove the valve core from the valve stem, and deflate the tire completely.

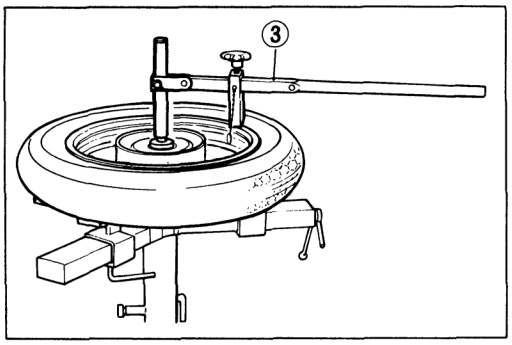
NOTE:
Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



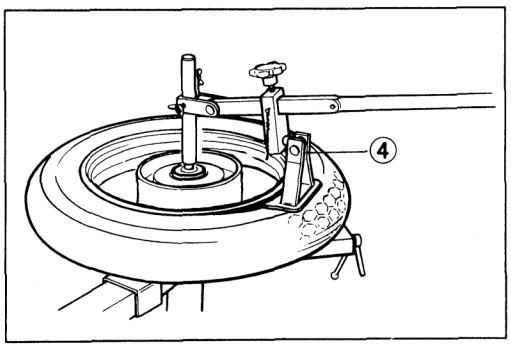
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ②.



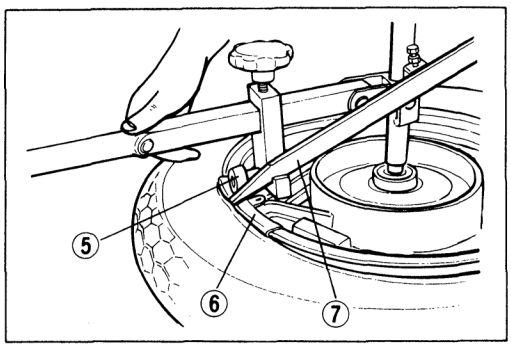
- Attach the operation arm ③ to the center shaft.



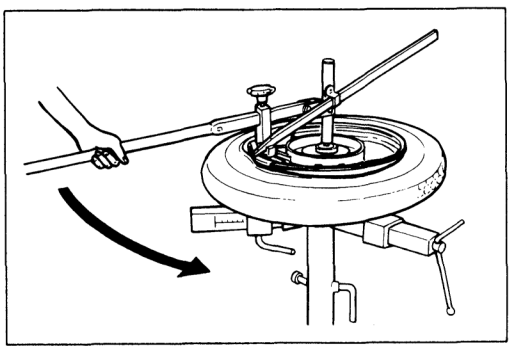
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- Install the rim guide roller ⑤.
- Install the rim protector ⑥, and raise the tire bead with the tire lever ⑦.

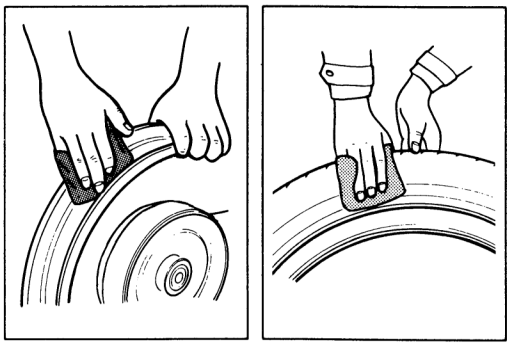


- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.



INSPECTION

WHEEL



Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.

* A distortion or crack.
* Any scratches or flaws in the bead seating area.
* Wheel runout (Axial & Radial) of more than 2.0 mm (0.08 in).

TIRE

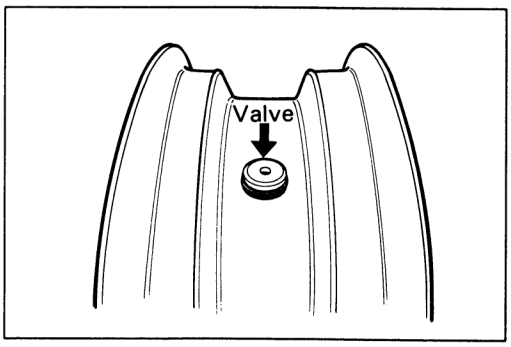
Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with a new one.

* A puncture or a split whose total length or diameter exceeds 6.0 mm (0.24 in).
* A scratch or split at the side wall.
* Tread depth less than 1.6 mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.
* Ply separation.
* Tread separation.
* Tread wear is extraordinarily deformed or distributed around the tire.
* Scratches at the bead.
* Cord is cut.
* Damage from skidding (flat spots).
* Abnormality in the inner liner.

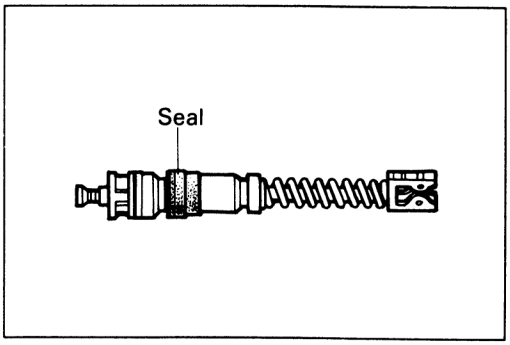
NOTE:
When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.

VALVE INSPECTION

Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.

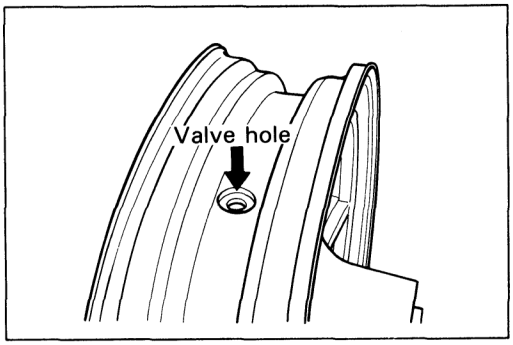


Inspect the removed valve core and replace with the new one if the seal rubber is abnormally deformed or worn.



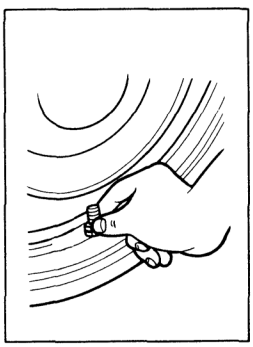
VALVE INSTALLATION

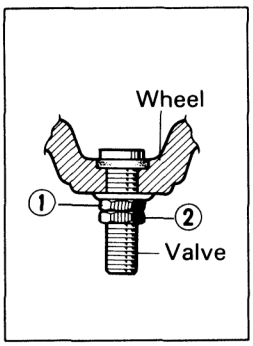
Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.



CAUTION:

When installing the valve, tighten the nut ① by hand as much as possible. Holding the nut ① under this condition, tighten the lock nut ②. Do not overtighten the nut ① as this may distort the rubber packing and cause an air leak.



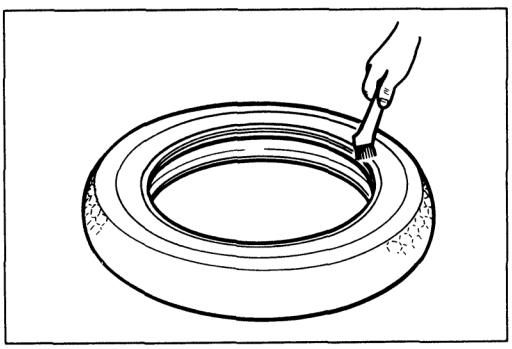


TIRE MOUNTING

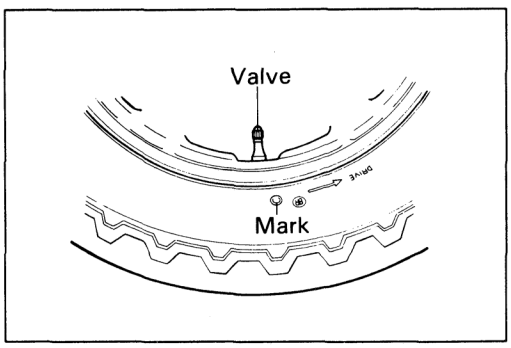
- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

CAUTION:

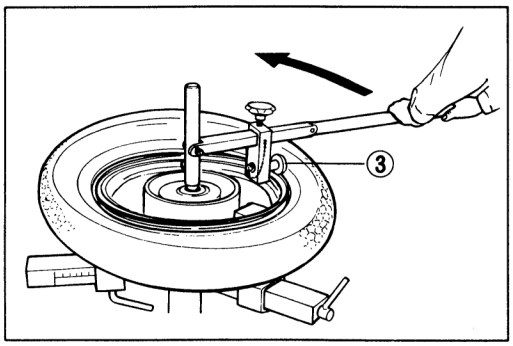
Never apply grease, oil or gasoline to the tire bead.



- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing mark of the tire with the valve as shown.

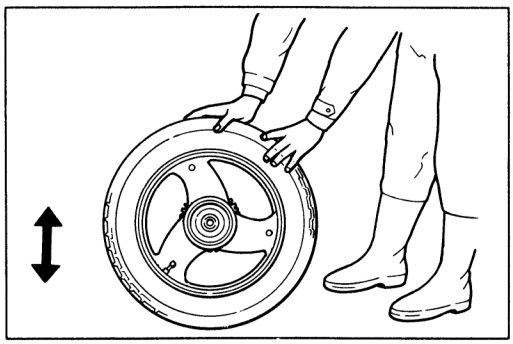


- Set the bead pushing roller ③.
- Rotate the operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.



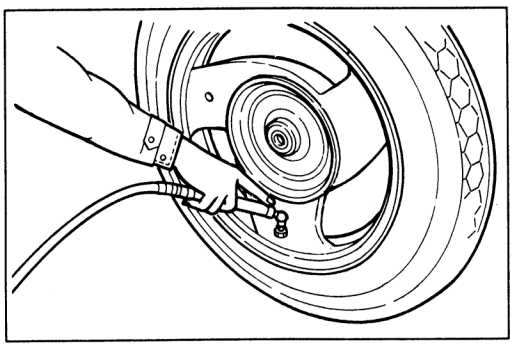
NOTE:
Before installing the valve core, inspect the core.

- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.



NOTE:
Before inflating, confirm that the balance mark lines up with the valve stem.

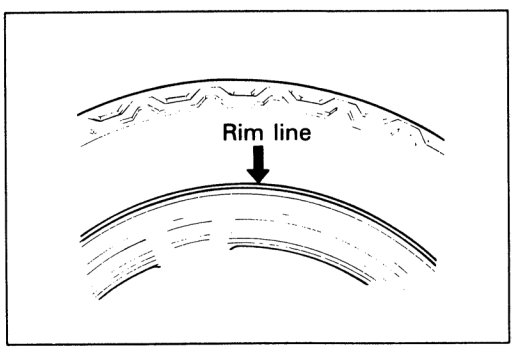
- Pump up the tire with air.



WARNING:
Do not inflate the tire to more than 400 kPa (4.0 kg/cm², 56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.

NOTE:
Check the "rim line" cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and wheel rim varies, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for both sides. Coat the bead with lubricant, and try again.

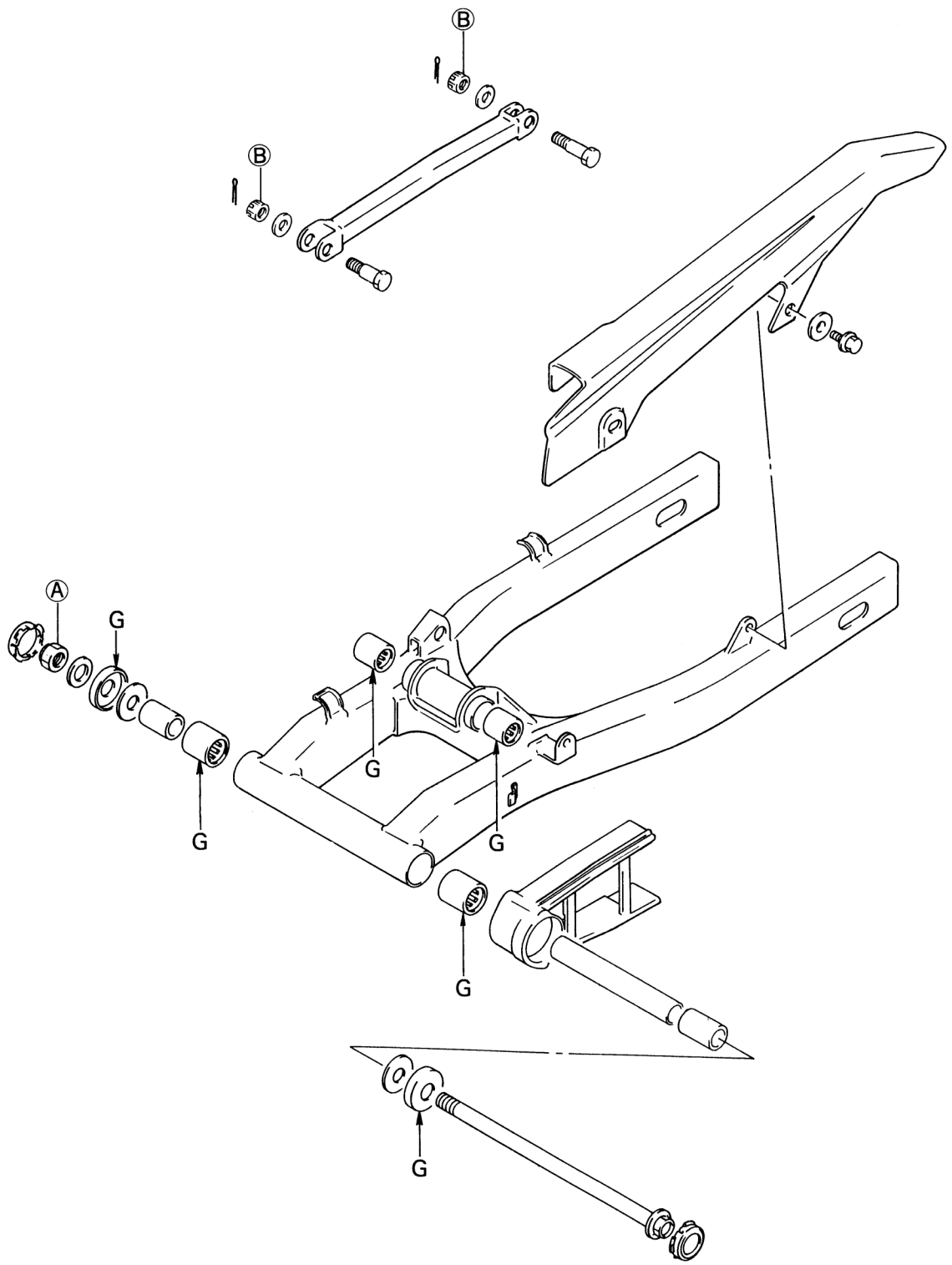
- After tire is properly seated to the wheel rim, adjust the air-pressure to the recommended pressure. Correct the wheel balance if necessary.



WARNING:
* **Do not run a repaired tire more than 50 km/h (30 mph) within 24 hours after tire repairing, since the patch may not be completely cured.**
* **Do not exceed 130 km/h (80 mph) with a repaired tire.**

REAR SUSPENSION

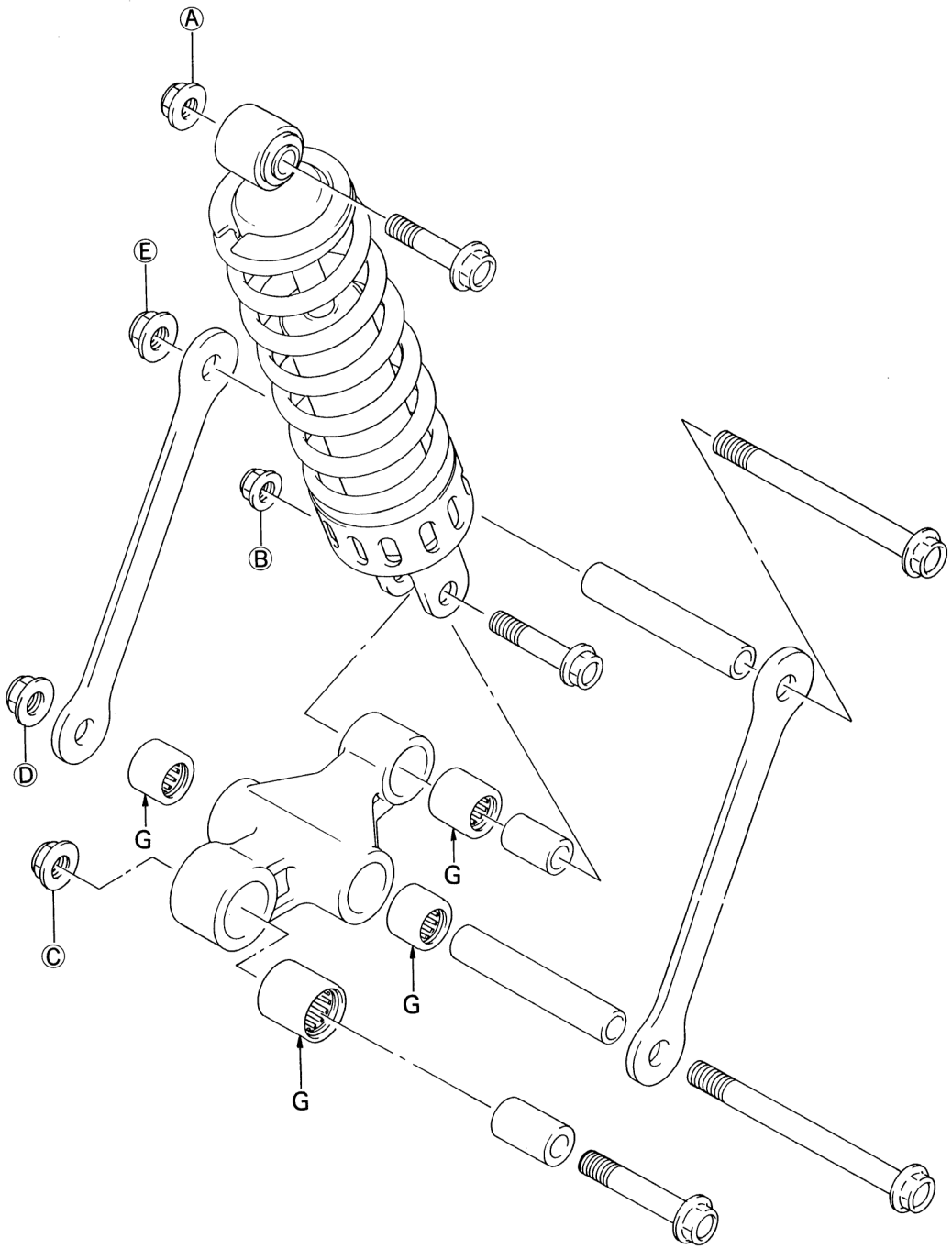
SWINGARM



Tightening torque
Ⓐ : 55 – 88 N·m
(5.5 – 8.8 kg-m, 40.0 – 63.5 lb-ft)
Ⓑ : 22 – 35 N·m
(2.2 – 3.5 kg-m, 16.0 – 25.5 lb-ft)

G : Apply SUPER GREASE "A"

SHOCK ABSORBER AND CUSHION LEVER



Tightening torque

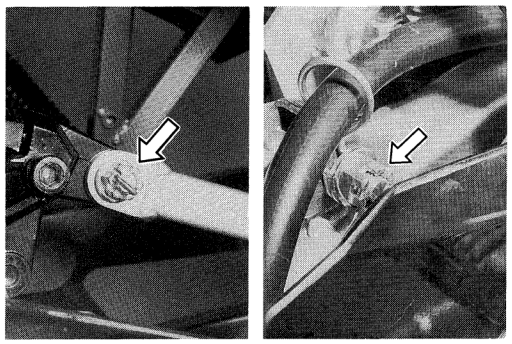
Ⓐ, Ⓑ : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)

Ⓒ, Ⓓ, Ⓔ : 70 – 100 N·m
(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)

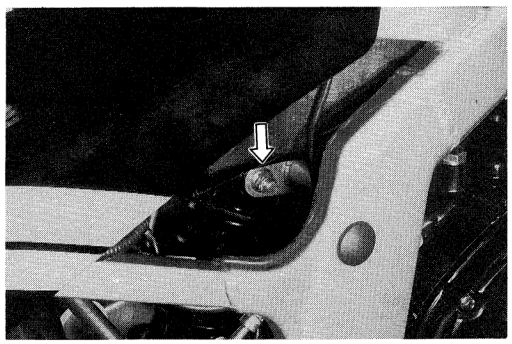
G : Apply SUPER GREASE "A"

REMOVAL

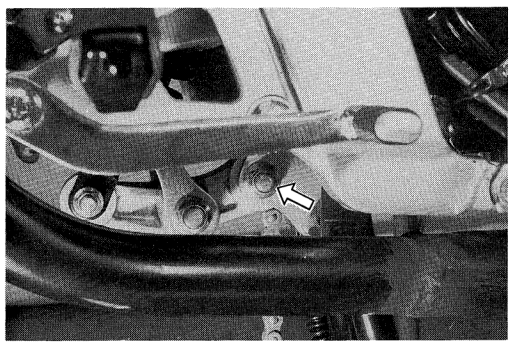
- Remove the brake caliper and rear wheel. (Refer to page 6-30.)
- Remove the cotter pins and torque link mounting bolts.



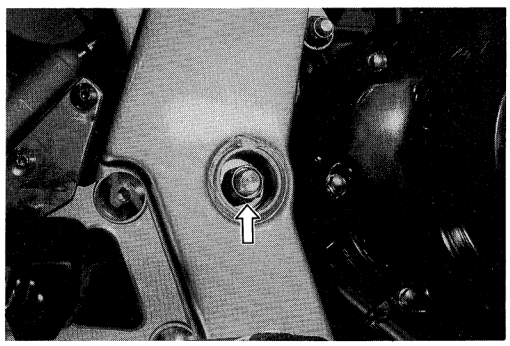
- Remove the shock absorber upper mounting bolt.



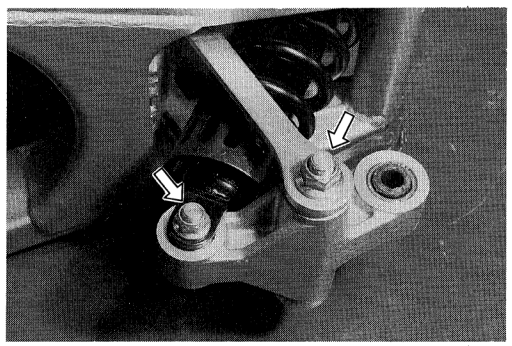
- Remove the cushion lever mounting bolt.



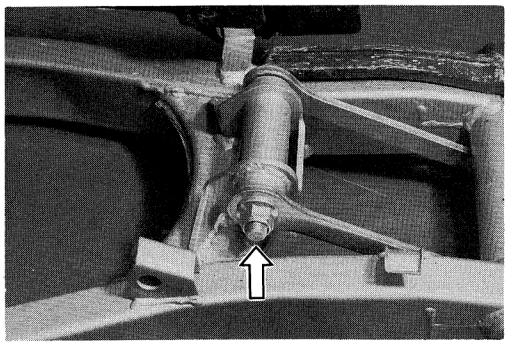
- Remove the swingarm pivot shaft.
- Remove the rear suspension assembly.



- Remove the cushion lever/rod bolt.
- Remove the shock absorber lower mounting bolt.



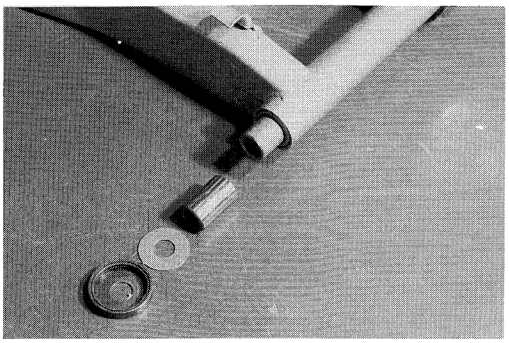
- Remove the cushion lever rod bolt.



INSPECTION

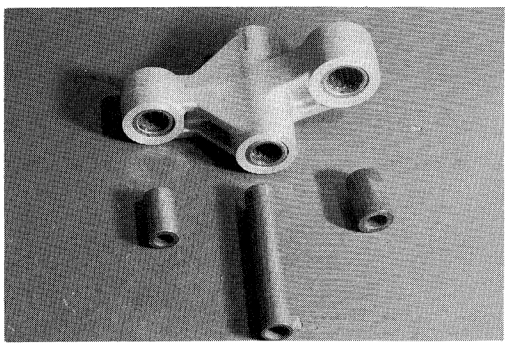
SWINGARM

Insert the spacer in the bearing and check the play by moving the spacer up and down. If an excessive play is noted, replace the bearing with a new one.
Inspect the spacer for any flaws or other damage.
Inspect each rubber part for wear and damage.



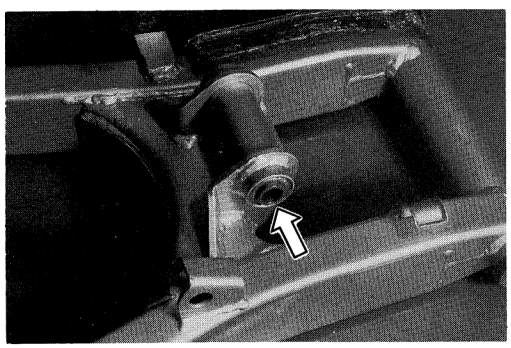
CUSHION LEVER

Inspect the spacer for any flows or other damage.
Insert the spacer in the bearing and check the play by moving the spacer up and down.
If an excessive play is noted, replace the bearing with a new one.



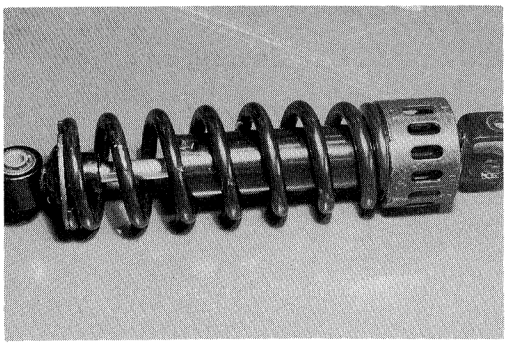
CUSHION LEVER ROD

Inspect the spacer for any flaws or other damage.
Insert the spacer in the bearing and check the play by moving the spacer up and down. If an excessive play is noted, replace the bearing with a new one.



SHOCK ABSORBER

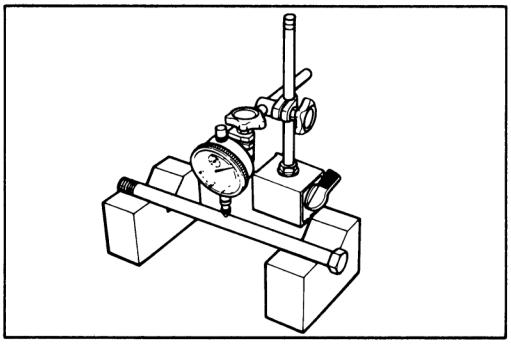
Inspect the shock absorber body, bushing and bearing for damage and oil leakage. If any defects are found, replace the shock absorber with new one.



SWINGARM PIVOT SHAFT

Using a dial gauge, check the pivot shaft runout and replace it if the runout exceeds the limit.

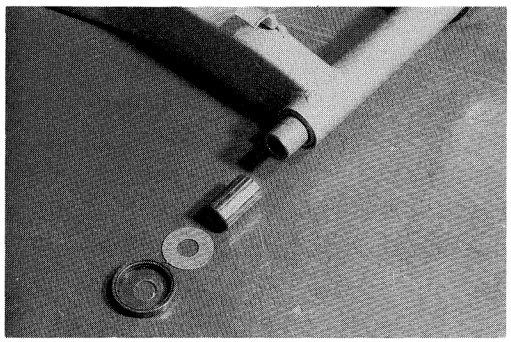
09900-20606 : Dial gauge (1/100)
09900-20701 : Magnetic stand } **Not available**
09900-21304 : V-block set (100 mm) } **in U.S.A.**
Service limit : 0.3 mm (0.01 in)



DISASSEMBLY

SWINGARM

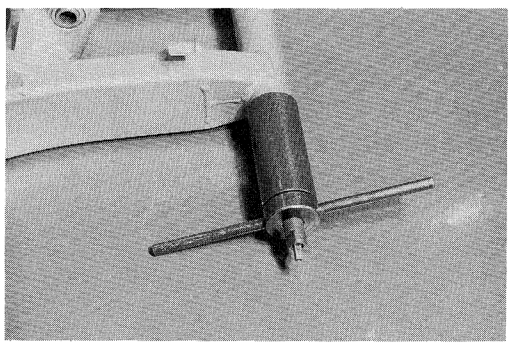
- Remove the dust seals, washers and spacers from the swingarm pivot.



- Remove the swingarm bearings by using the special tool.

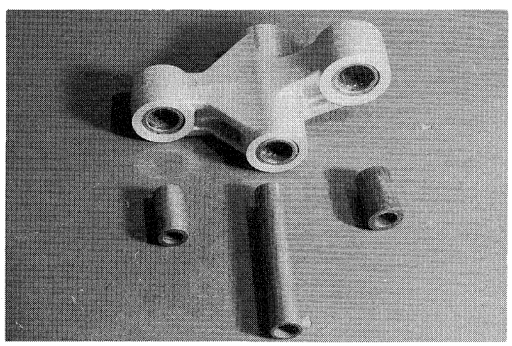
09941-44510 : Swingarm bearing remover

CAUTION:
The removed bearings should be replaced with new ones.



CUSHION LEVER

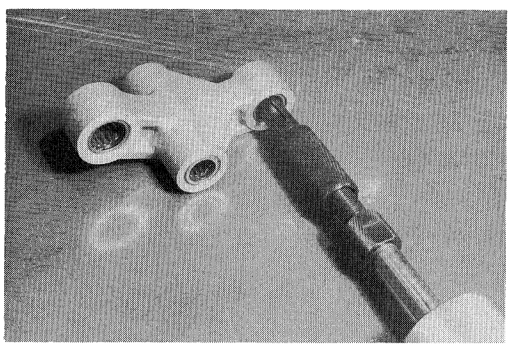
- Remove the spacers.



- Remove the bearings by using the special tool.

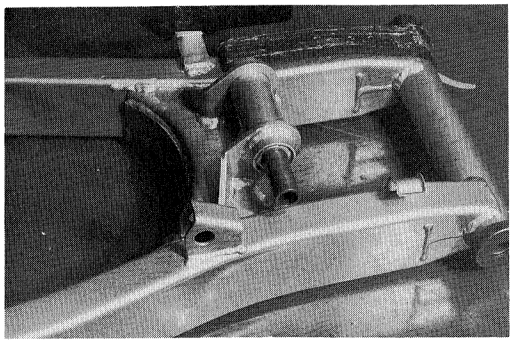
09923-73210 : Bearing remover

CAUTION:
The removed bearings should be replaced with new ones.



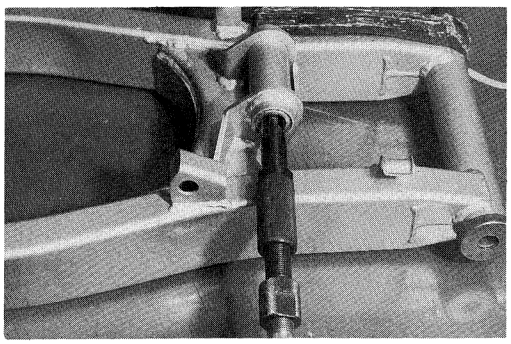
CUSHION LEVER ROD

- Remove the spacer from the swingarm.



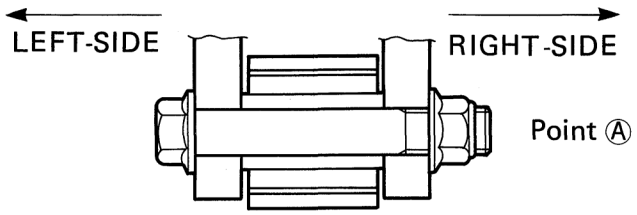
- Remove the bearing from the swingarm.

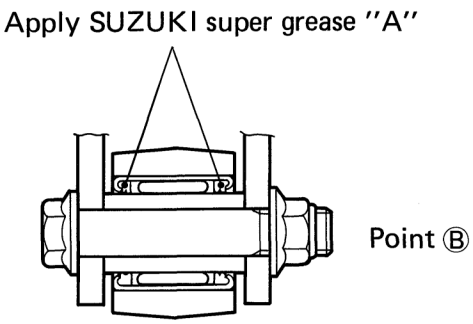
09923-73210 : Bearing remover



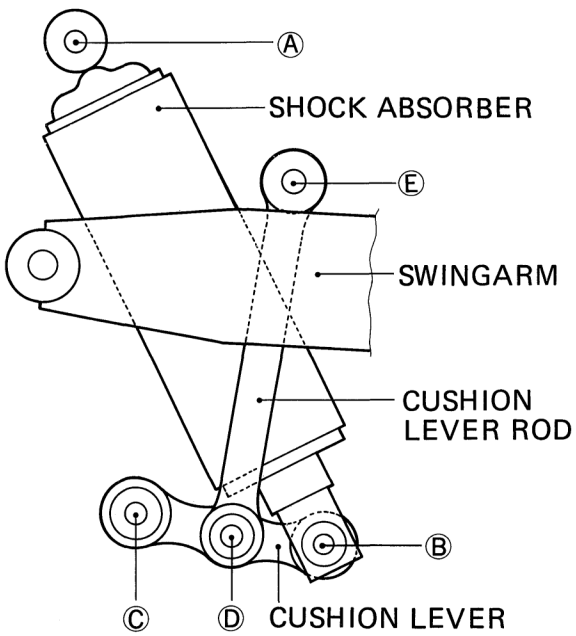
CAUTION:
The removed bearings should be replaced with new ones.

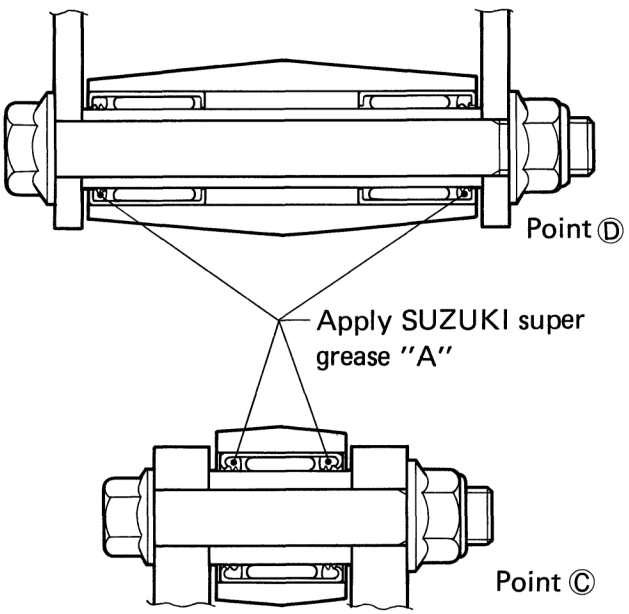
REASSEMBLY INFORMATION

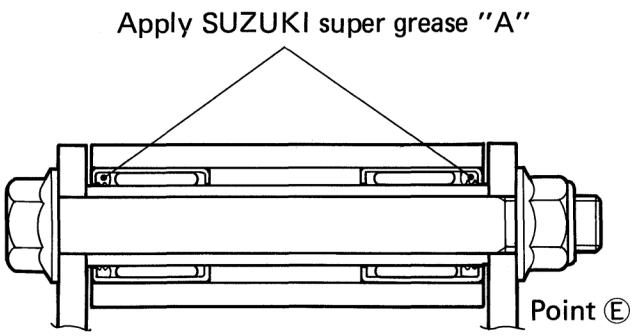




Tightening torque			
ITEM	N·m	kg-m	lb-ft
Ⓐ Ⓑ	40–60	4.0–6.0	29.0–43.5
Ⓒ Ⓓ Ⓔ	70–100	7.0–10.0	50.5–72.5







REASSEMBLY AND REMOUNTING

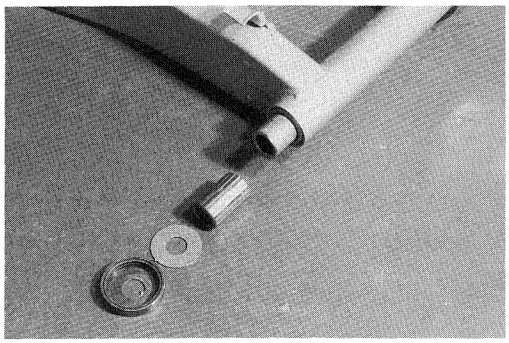
Reassemble and remount the swingarm, rear shock absorber, rear cushion lever rods and cushion lever. Pay attention to the following points:

SWINGARM

- Force-fit the bearings into the swingarm pivot.

09941-34513 : Steering outer race installer

NOTE:
When installing the bearings, punch-marked side of bearing comes outside.

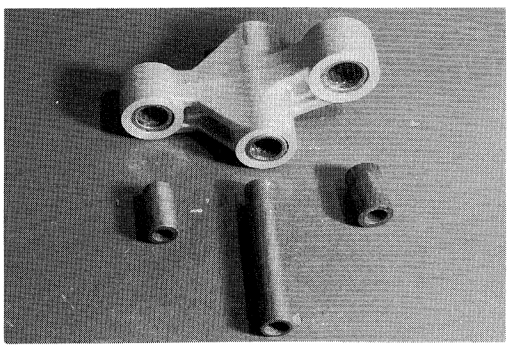


- Apply grease to the spacers and dust seals when installing them.

(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

CUSHION LEVER

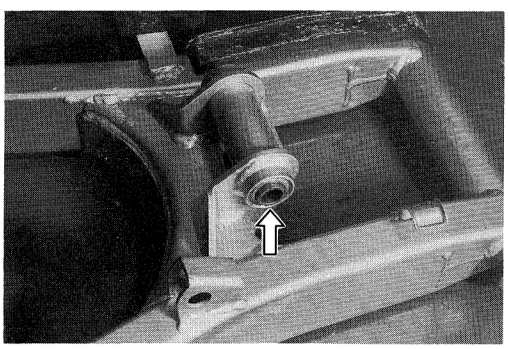
- Install the cushion lever bearings by using an appropriate drift.
- Apply grease to the bearings.



(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

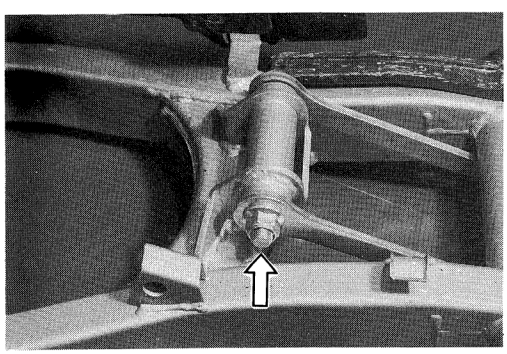
CUSHION LEVER ROD

- Install the cushion lever rod bearings by using an appropriate drift.
- Apply grease to the bearings.



(For U.S.A. model)
99000-25030 : SUZUKI SUPER GREASE "A"
(For the other models)
99000-25010 : SUZUKI SUPER GREASE "A"

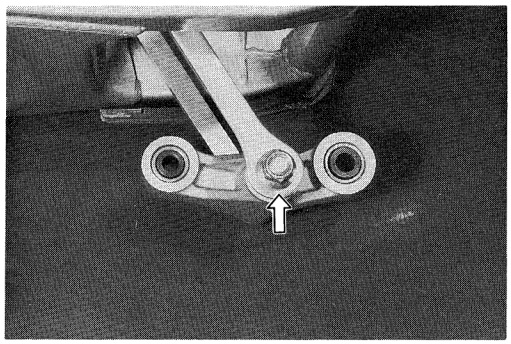
- Install the cushion lever rod bolt and tighten the nut to the specified torque.



Tightening torque : 70 – 100 N·m
(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)

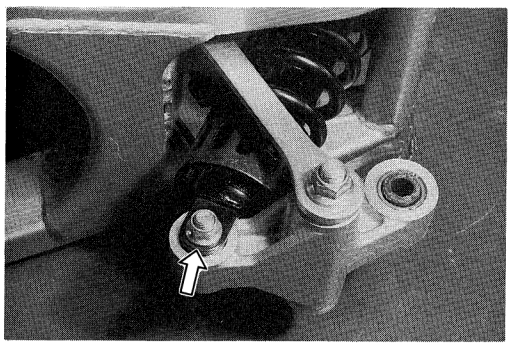
- Install the cushion lever/rod bolt and tighten the nut to the specified torque.

Tightening torque : 70 – 100 N·m
(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)



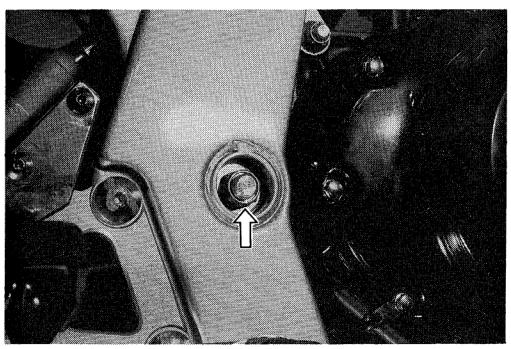
- Install the shock absorber lower mounting bolt and tighten the nut to the specified torque.

Tightening torque : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)



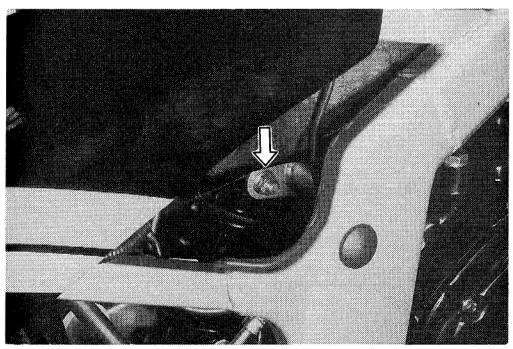
- Install the swingarm pivot shaft and tighten the nut to the specified torque.

Tightening torque : 55 – 88 N·m
(5.5 – 8.8 kg-m, 40.0 – 63.5 lb-ft)



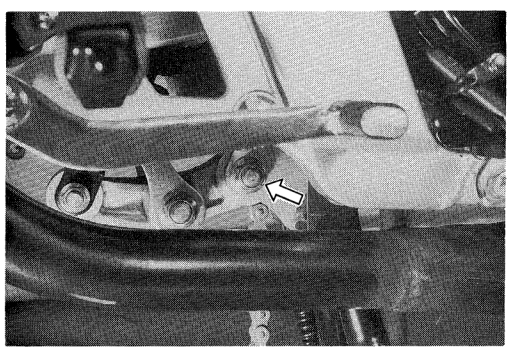
- Install the shock absorber upper mounting bolt and tighten the nut to the specified torque.

Tightening torque : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)



- Install the cushion lever mounting bolt and tighten the nut to the specified torque.

Tightening torque : 70 – 100 N·m
(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)



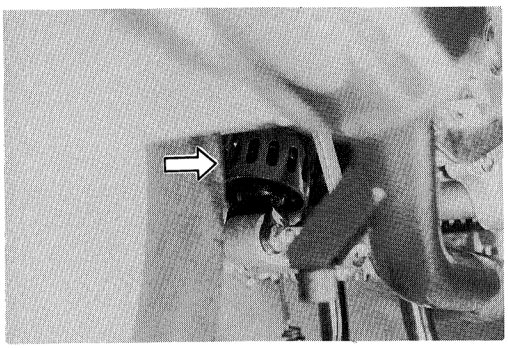
FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and rear wheel, the following adjustments are required before driving motorcycle.

* Drive chain ..... Page 2-13
* Rear brake ..... Page 2-15
* Tire pressure ..... Page 2-17
* Shock absorber ..... This page

SHOCK ABSORBER SPRING PRE-LOAD

* Position "1" provides the softest spring pre-load.
* Position "7" provides the stiffest spring pre-load. (Factory setting : 4/7)



SERVICE INFORMATION

CONTENTS

TROUBLESHOOTING 7- 1
WIRING DIAGRAM 7- 8
WIRE HARNESS, CABLE AND HOSE ROUTING 7-10
SPECIAL TOOLS 7-24
TIGHTENING TORQUE 7-27
SERVICE DATA 7-30

TROUBLESHOOTING

ENGINE

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Engine does not start, or is hard to start.	**Compression too low**	
	1. Out of adjustment tappet clearance	Adjust
	2. Worn valve guide or poor seated valve	Repair or replace
	3. Mistiming valve operation	Adjust
	4. Excessively worn piston ring	Replace
	5. Worn down cylinder bore	Replace or rebore
	6. Too slow starter motor cranking	Consult "electrical complaints"
	7. Poor seated spark plug	Retighten
	Spark plug no sparking	
	1. Fouled spark plug	Clean
	2. Wet spark plug	Clean and dry
	3. Defective ignition coil	Replace
	4. Opened or shorted high-tension cord	Replace
	5. Defective signal generator or ignitor unit	Replace
	No fuel flow to carburetor	
	1. Clogged fuel tank vent hole	Clean or replace
	2. Clogged or defective fuel cock	Clean or replace
	3. Defective carburetor needle valve	Replace
	4. Clogged fuel hose or fuel filter	Clean or replace
Engine stalls easily.	1. Fouled spark plug	Clean
	2. Defective signal generator or ignitor unit	Replace
	3. Clogged fuel hose	Clean
	4. Clogged carburetor jet	Clean
	5. Out of adjustment tappet clearance	Adjust
Engine is noisy.	**Excessive valve chatter**	
	1. Too large tappet clearance	Adjust
	2. Weakened or broken valve spring	Replace
	3. Worn down rocker arm or rocker arm shaft	Replace
	Noise appears to come from piston	
	1. Worn down piston or cylinder	Replace
	2. Fouled combustion chamber with carbon	Clean
	3. Worn piston pin or piston pin bore	Replace
	4. Worn piston ring or piston ring groove	Replace
	Noise appears to come from timing chain	
	1. Stretched chain	Replace
	2. Worn sprocket	Replace
	3. No working tension adjuster	Repair or replace
	Noise appears to come from clutch	
	1. Worn countershaft splines or hub	Replace
	2. Worn clutch plate teeth	Replace
	3. Distorted clutch plate	Replace
	4. Worn clutch release bearing	Replace
	5. Weakened clutch damper	Replace primary driven gear

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Engine is noisy.	**Noise appears to come from crankshaft**	
	1. Rattling bearing	Replace
	2. Worn and burnt big end bearing	Replace
	3. Worn and burnt journal bearing	Replace
	4. Thrust clearance to large	Replace thrust bearing
	Noise appears to come from transmission	
	1. Worn or rubbed gear	Replace
	2. Badly worn splines	Replace
	3. Worn or rubbed primary gear	Replace
	4. Badly worn bearing	Replace
Clutch slips.	1. Out of adjustment or loss of play	Adjust
	2. Weakened clutch springs	Replace
	3. Worn or distorted pressure plate	Replace
	4. Distorted clutch plate	Replace
Clutch drags.	1. Out of adjustment or too much play	Adjust
	2. Weakened some clutch springs	Replace
	3. Distorted pressure plate or clutch plate	Replace
Transmission does not shift.	1. Broken gearshift cam	Replace
	2. Distorted gearshift fork	Replace
	3. Worn gearshift pawl	Replace
Transmission does not shift back.	1. Broken return spring on shift shaft	Replace
	2. Rubbed or sticky shift shaft	Repair
	3. Distorted or worn gearshift fork	Replace
Transmission jumps out of gear.	1. Worn shifting gear on driveshaft or countershaft	Replace
	2. Distorted or worn gearshift fork	Replace
	3. Weakened stopper spring on gearshift stopper	Replace
	4. Worn gearshift pawl	Replace
Engine idles poorly.	1. Out of adjustment tappet clearance	Adjust
	2. Poor seated valve	Replace
	3. Defective valve guide	Replace
	4. Worn rocker arm or rocker arm shaft	Replace
	5. Too wide spark plug gap	Adjust or replace
	6. Defective ignition coil	Replace
	7. Defective signal generator or ignitor unit	Replace
	8. Out of adjustment carburetor fuel level	Adjust
	9. Clogged carburetor jet	Clean
	10. Unbalance carburetor	Adjust
Engine runs poorly in high speed range.	1. Weakened valve spring	Replace
	2. Worn cam	Replace
	3. Incorrect valve timing	Adjust
	4. Too narrow spark plug gap	Adjust
	5. Ignition unadvanced sufficiently due to poorly working timing advance circuit	Replace
	6. Defective ignition coil	Replace
	7. Defective signal generator or ignitor unit	Replace
	8. Too low fuel level	Adjust
	9. Clogged air cleaner element	Clean
	10. Clogged fuel hose	Clean

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Exhaust smoke is dirty or heavy.	1. Too much engine oil	Drain out excess oil
	2. Worn piston ring or cylinder	Replace
	3. Worn valve guide	Replace
	4. Scored or scuffed cylinder wall	Rebore or replace
	5. Worn valve stem	Replace
	6. Defective stem seal	Replace
	7. Worn oil ring side rail	Replace
Engine lacks power.	1. Too small tappet clearance	Adjust
	2. Weakened valve spring	Replace
	3. Incorrect valve timing	Adjust
	4. Worn piston ring or cylinder	Replace
	5. Poor seated valve	Repair
	6. Fouled spark plug	Clean or replace
	7. Incorrect spark plug gap	Adjust or replace
	8. Clogged carburetor jet	Clean
	9. Incorrect fuel level	Adjust
	10. Clogged air cleaner element	Clean
	11. Loosened carburetor balancing screw	Fix
	12. Unreasonable sucked air	Retighten or replace
	13. Too much engine oil	Drain out excess oil
Engine overheats.	1. Heavy carbon deposit on piston crown	Clean
	2. Unenough engine oil	Add oil
	3. Defective oil pump	Replace
	4. Clogged oil circuit	Clean
	5. Too low fuel level	Adjust
	6. Unreasonable sucked air	Retighten or replace
	7. Using incorrect engine oil	Change

CARBURETOR

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Starting troubles.	1. Clogged starter jet	Clean
	2. Clogged starter pipe	Clean
	3. Leaked air from joint between starter body and carburetor	Retighten, adjust or replace
	4. Leaked air from carburetor joint or vacuum gauge joint	Check and adjust
	5. Properly unoperated starter plunger	Check and adjust
Idling or low speed troubles.	1. Clogged or loosened pilot jet and pilot air jet	Check and clean
	2. Leaked air from carburetor joint, vacuum gauge joint or starter	Check and clean
	3. Clogged pilot outlet or bypass	Check and clean
	4. Unfully closed starter plunger	Check and adjust
Medium or high speed troubles.	1. Clogged main jet or main air jet	Check and clean
	2. Clogged needle jet	Check and clean
	3. Properly unoperated throttle valve	Check
	4. Clogged fuel filter	Check and clean

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Overflow and/or fuel level fluctuates.	1. Worn or damaged needle valve 2. Broken needle valve spring 3. Properly unworked float 4. Adhered foreign matter on needle valve 5. Too high or low fuel level	Replace Replace Check and adjust Clean Adjust

ELECTRICAL

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
No-sparking or poor sparking.	1. Defective ignition coil 2. Defective spark plug 3. Defective signal generator or ignitor unit	Replace Replace Replace
Spark plug fouls soon with carbon.	1. Too rich fuel/air mixture 2. High idling speed 3. Incorrect used gasoline 4. Dirty air cleaner element	Adjust carburetion Adjust Change Clean
Spark plug fouls soon.	1. Worn piston ring 2. Worn piston or cylinder 3. Excessive valve stem/guide clearance 4. Worn valve stem oil seal	Replace Replace Replace Replace
Spark plug electrode overheats or burns.	1. Overheated engine 2. Loosened spark plug 3. Too lean fuel/air mixture	Tune up Retighten Adjust carburetion
Generator does not charge.	1. Opened or shorted lead wire 2. Loosened lead connection 3. Shorted, grounded or opened generator coil 4. Shorted or punctured regulator and rectifier	Repair or replace Fix Replace Replace
Generator charges below than specification.	1. Tended lead wire to get shorted or open-circuited or loosely connected at terminals 2. Grounded or open-circuited generator stator coil 3. Defective regulator and rectifier 4. Unenough battery electrolyte 5. Defective battery cell plates	Repair or fix Replace Replace Add distilled water Replace battery
Generator overcharges.	1. Short-circuited battery interior 2. Damaged or defective regulator resistor element 3. Poorly grounded regulator	Replace battery Replace Clean and tighten
Charging is unstable.	1. Frayed lead wire insulation due to vibration, resulting in intermittent shorting 2. Shorted generator interior 3. Defective regulator and rectifier	Repair or replace Replace Replace
Starter button is uneffective.	1. Run down battery 2. Defective switch contact 3. Properly unseated brush on starter motor commutator 4. Defective starter relay 5. Defective side-stand relay 6. Defective side-stand switch or neutral switch	Repair or replace Replace Repair or replace Replace Replace Replace

BATTERY

SYMPTON	PROBABLE CAUSE	REMEDY
"SULFATION": acidic white powdery substance or spots on cell plates surface.	1. Unenough electrolyte	Add distilled water and recharge it. —If the battery seems not to damage, "sulfation" has not advanced too far.
	2. Cracked battery case	Replace battery.
	3. Left battery for a long time in a run-down condition	Replace battery.
	4. Contaminated electrolyte (Foreign matter has entered in the battery and become mixed with the electrolyte.)	If "sulfation" seems not to advance too far, try to restore the battery to replace with new electrolyte, and recharge it fully.
Battery runs down quickly.	1. Incorrect charging method	Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation.
	2. Lost active material in cell plate as a result of overcharging	Replace battery and correct charging method.
	3. Battery existing short-circuit condition due to excessive accumulation of sediments caused by high electrolyte specific gravity	Replace battery.
	4. Too low electrolyte specific gravity	Recharge battery fully under specified charging current.
	5. Contaminated electrolyte	Replacing electrolyte, recharge the battery.
	6. Too old battery	Replace battery.
Battery polarity reverses.	The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.	Replace battery and be sure to connect the battery properly.
Battery causes "sulfation".	1. Too low or too high charging rate. (Unused battery should be recharged at least once a month to avoid sulfation.)	Replace battery.
	2. Unreasonable battery electrolyte level	Keep the electrolyte to "MAX" level.
	3. Too high or too low specific gravity	Adjust the specific gravity by consulting battery maker's directions.
	4. Left battery unused for too long in cold climate	Replace battery, if badly sulfated.
Battery discharges too rapidly.	1. Dirty container top and sides	Clean
	2. Impurities in the electrolyte	Change electrolyte.
	3. Too high electrolyte specific gravity	Change electrolyte by consulting battery maker's directions.

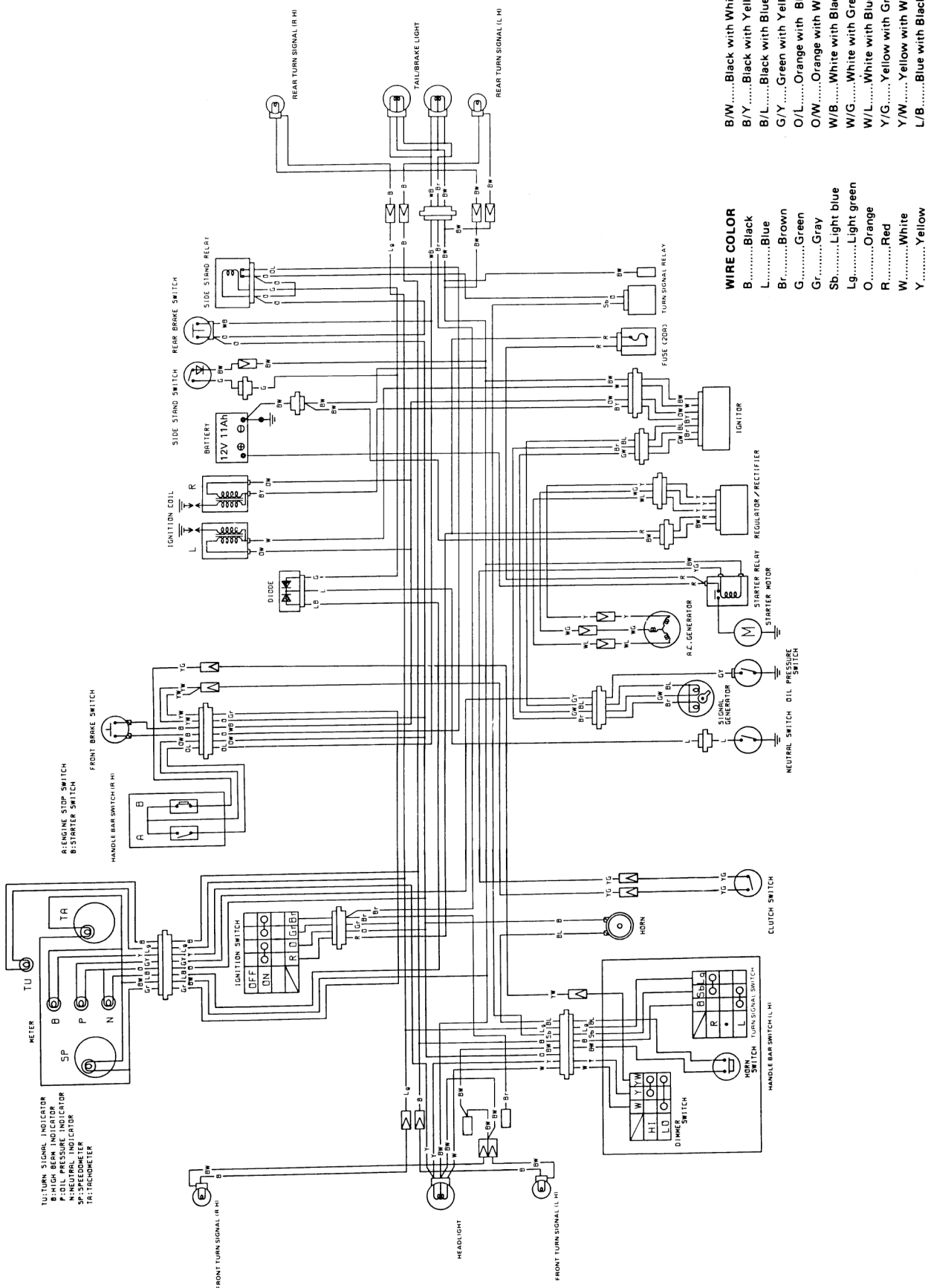
CHASSIS

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Steering is heavy.	1. Overtightened steering stem nut 2. Broken steering stem bearing 3. Distorted steering stem 4. Unenough tire pressure	Adjust Replace Replace Adjust
Handle is wobbly.	1. Unbalance of right and left front forks 2. Distorted front fork 3. Distorted front axle 4. Crooked tire	Replace Repair or replace Replace Replace
Front wheel is wobbly.	1. Distorted wheel rim 2. Worn down front wheel bearing 3. Defective or incorrect tire 4. Loosened front axle 5. Incorrect front fork oil level	Replace Replace Replace Retighten Adjust
Front suspension is too soft.	1. Weakened spring 2. Unenough fork oil level	Replace Refill
Front suspension is too stiff.	1. Too viscous fork oil 2. Too much fork oil	Replace Drain excess oil
Front suspension is noisy.	1. Unenough fork oil level 2. Loosened suspension mountings	Refill Retighten
Rear wheel is wobbly.	1. Distorted wheel rim 2. Worn down rear wheel or swingarm bearing 3. Defective or incorrect tire 4. Worn swingarm and rear cushion bearing 5. Loosened suspension mountings	Replace Replace Replace Replace Retighten
Rear suspension is too soft.	1. Weakened shock absorber spring 2. Improper rear suspension adjuster setting 3. Leaked shock absorber oil	Replace Adjust Replace
Rear suspension is too stiff.	1. Improper rear suspension adjuster setting 2. Bent shock absorber shaft 3. Bent swingarm 4. Worn swingarm and rear cushion bearing	Adjust Replace Replace Replace
Rear suspension is noisy.	1. Loosened suspension mountings 2. Worn swingarm and rear cushion bearing	Retighten Replace

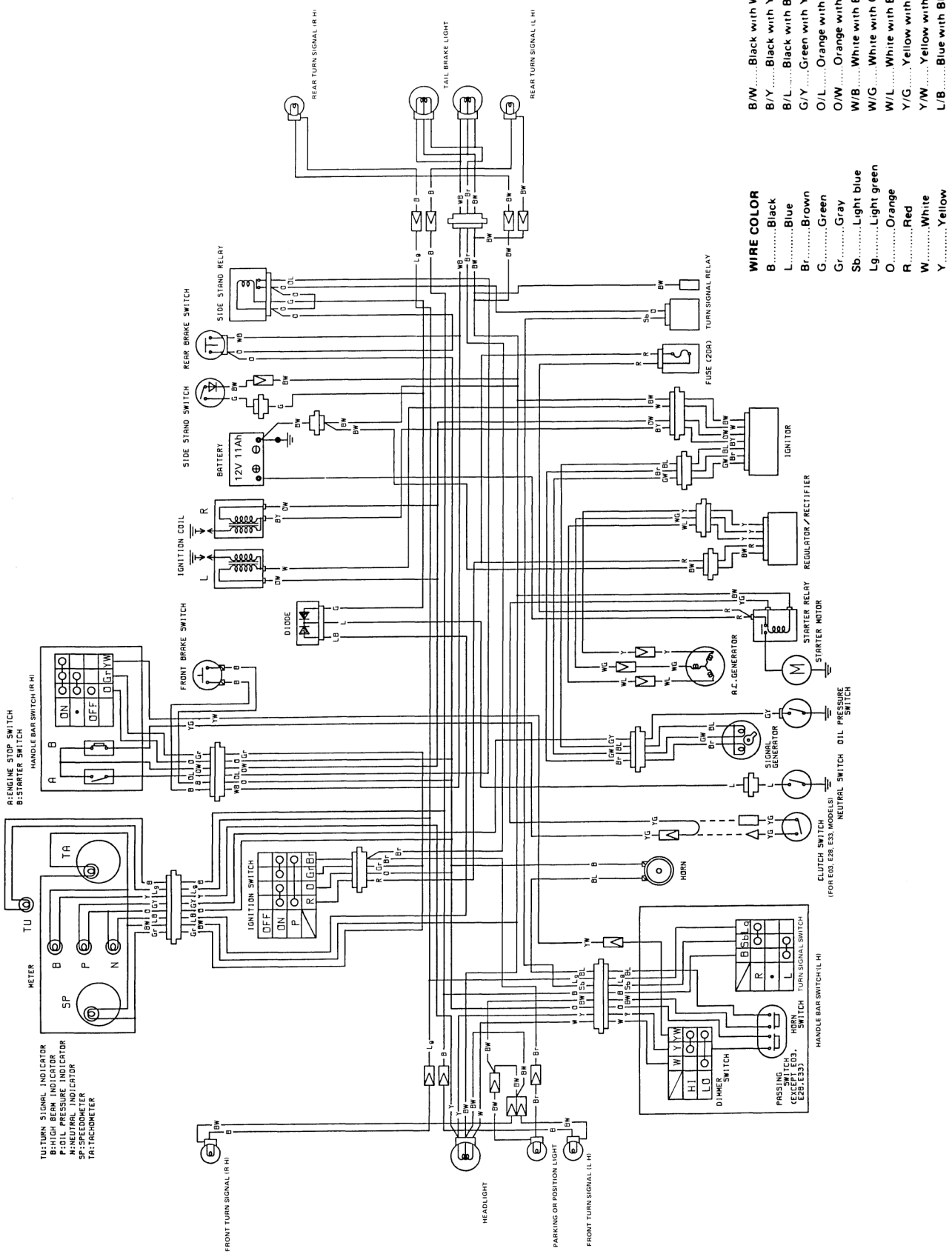
BRAKES

COMPLAINT	SYMPTOM AND POSSIBLE CAUSES	REMEDY
Brake power is insufficient.	1. Leaked brake fluid 2. Worn pad 3. Adhered oil to pad surface 4. Worn disc 5. Entered air in hydraulic system	Repair or replace Replace Clean disc and pad Replace Bleed air
Brake squeaks.	1. Adhered carbon to surface 2. Tilted pad 3. Damaged wheel bearing 4. Loosened front and rear wheel axles 5. Worn pad 6. Contaminated brake fluid 7. Clogged master cylinder return port	Repair with sandpaper Modify pad fitting Replace Tighten to specified torque Replace Replace brake fluid Clean
Brake lever stroke is excessive.	1. Entered air in hydraulic system 2. Insufficient brake fluid 3. Improper brake fluid quality	Bleed air Replenish Replace
Brake fluid leaks.	1. Insufficient connection joint tightening 2. Cracked brake hose 3. Worn piston and/or cup	Retighten Replace Replace

WIRING DIAGRAM FOR U.S.A. AND CANADA MODELS

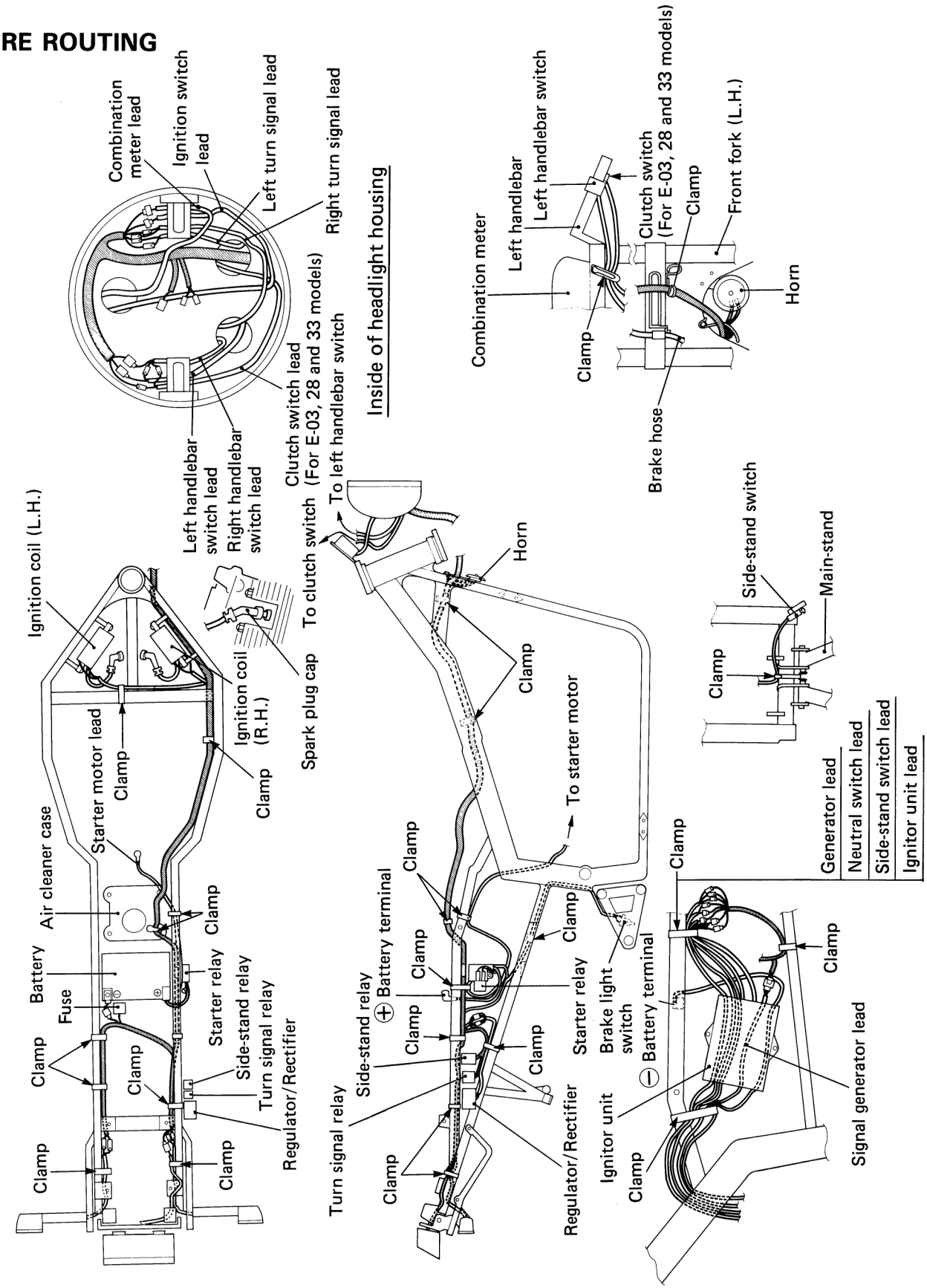


FOR OTHER MODELS

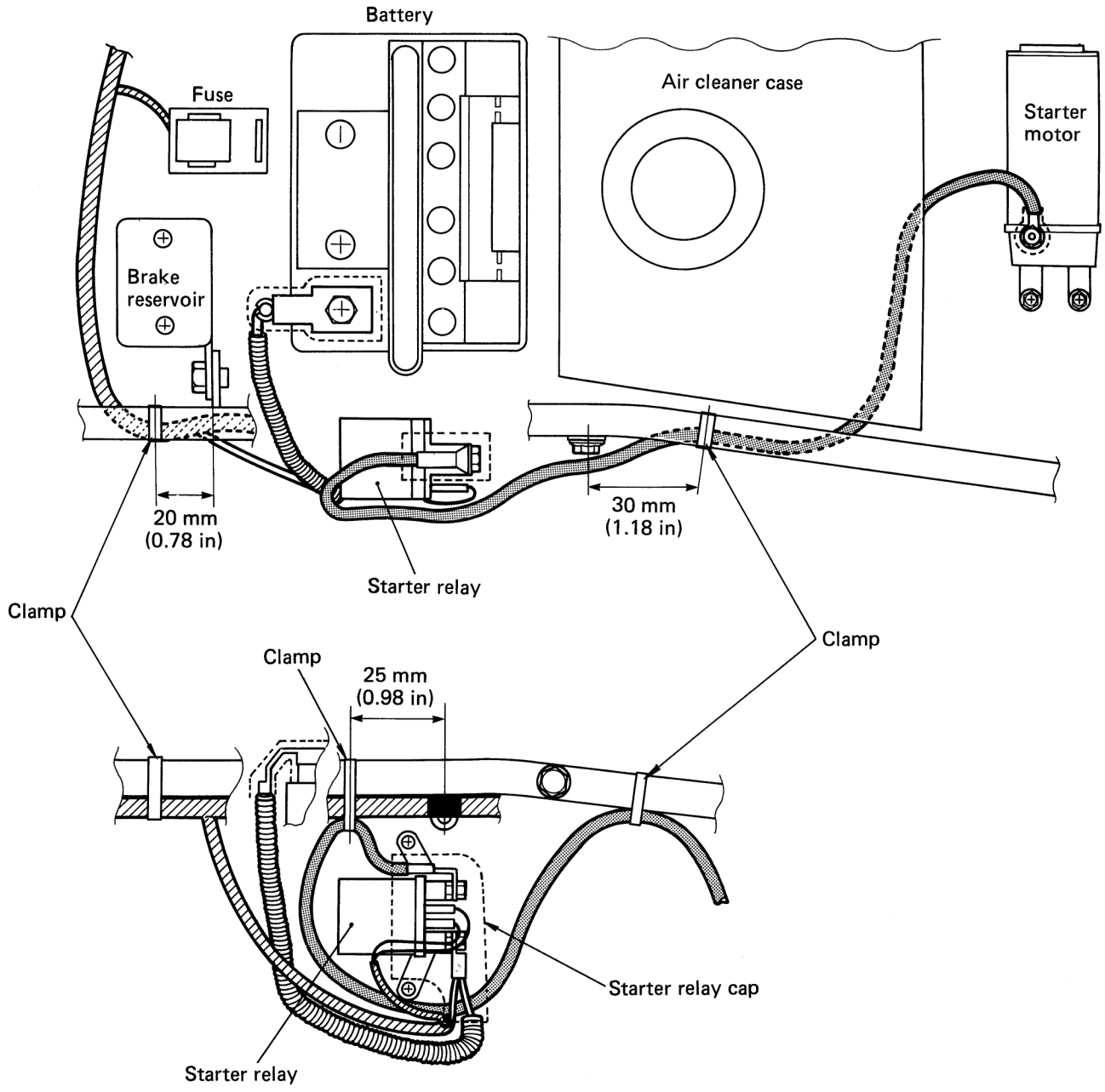


WIRE HARNESS, CABLE AND HOSE ROUTING

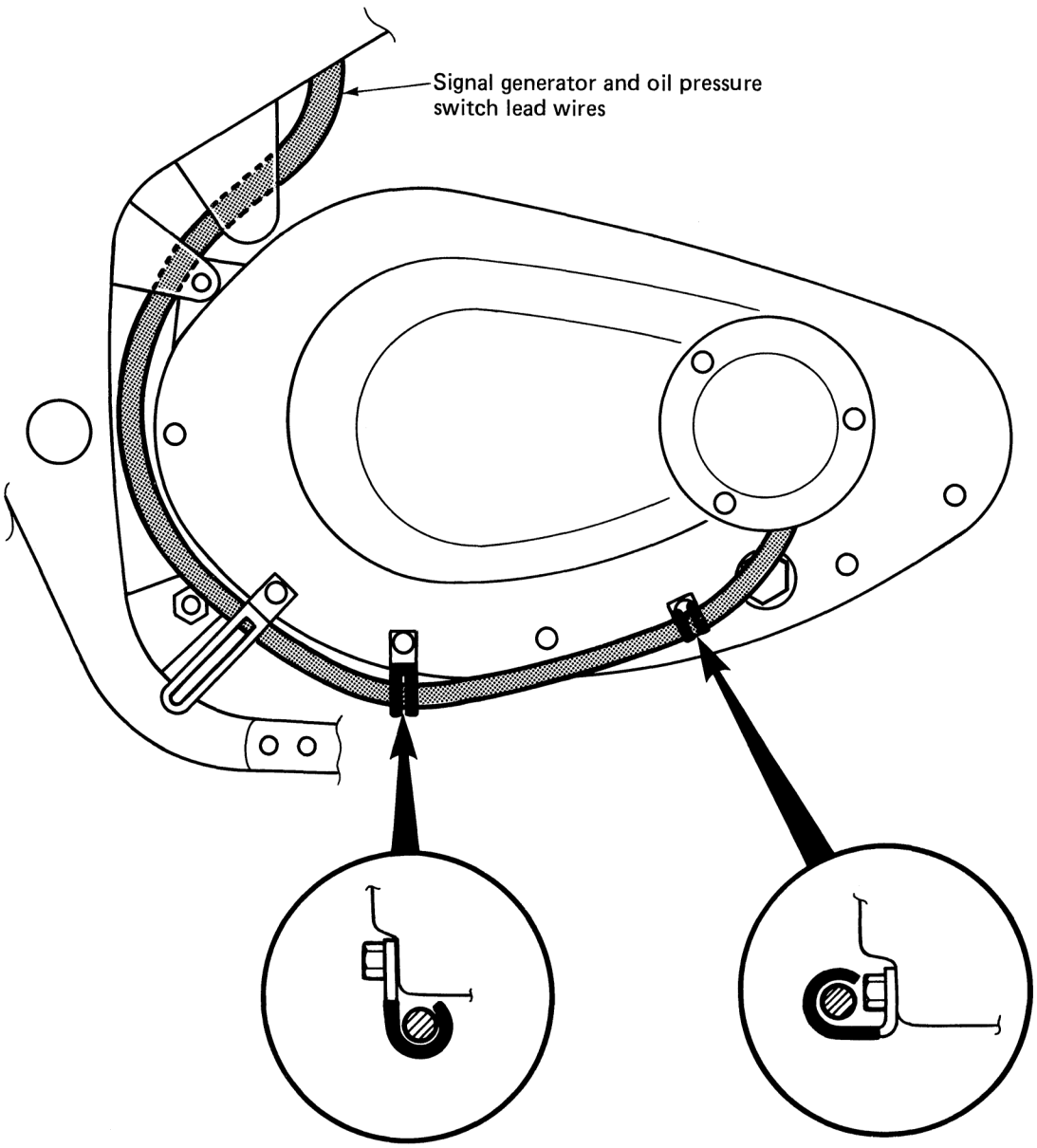
WIRE ROUTING



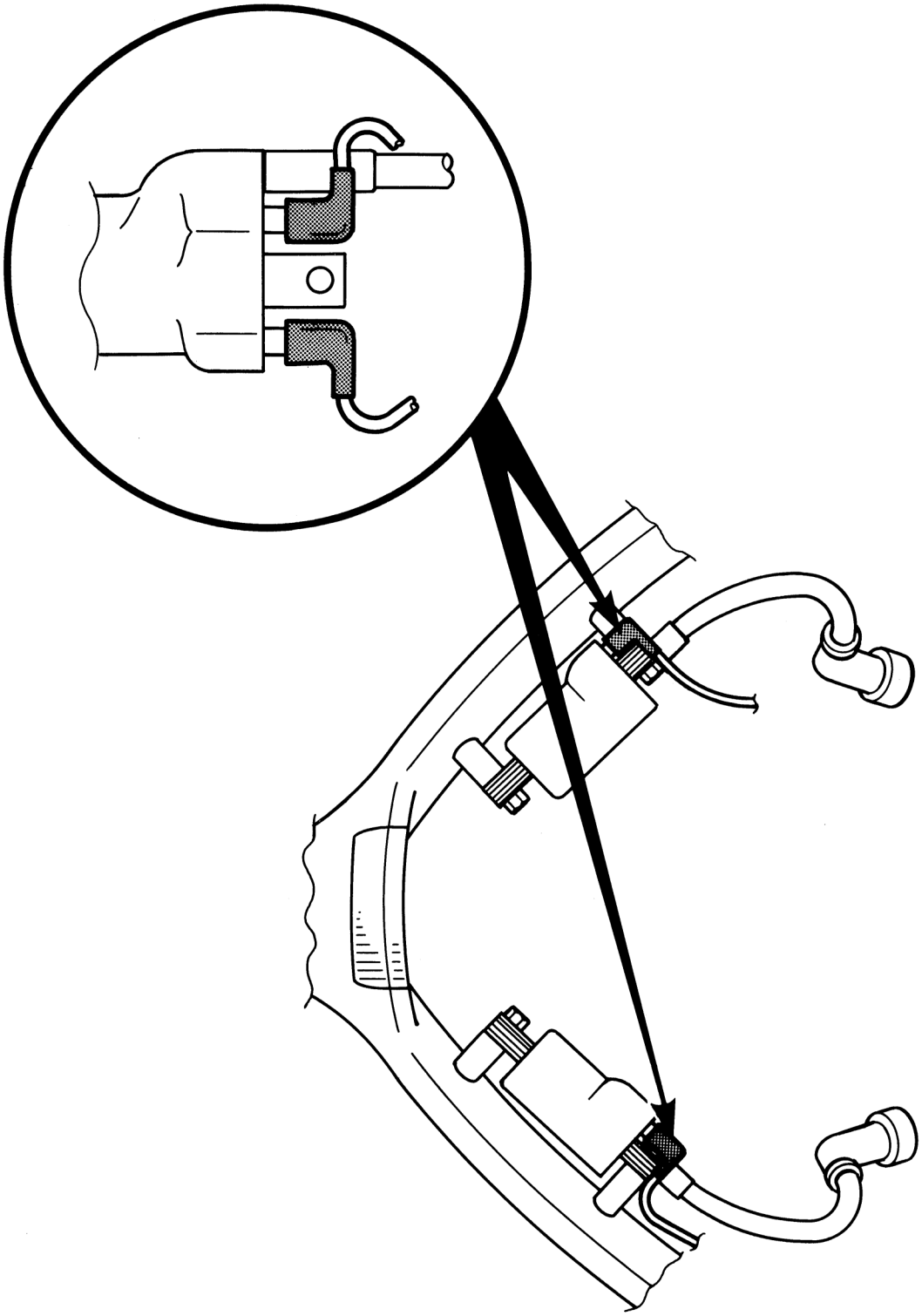
WIRE ROUTING



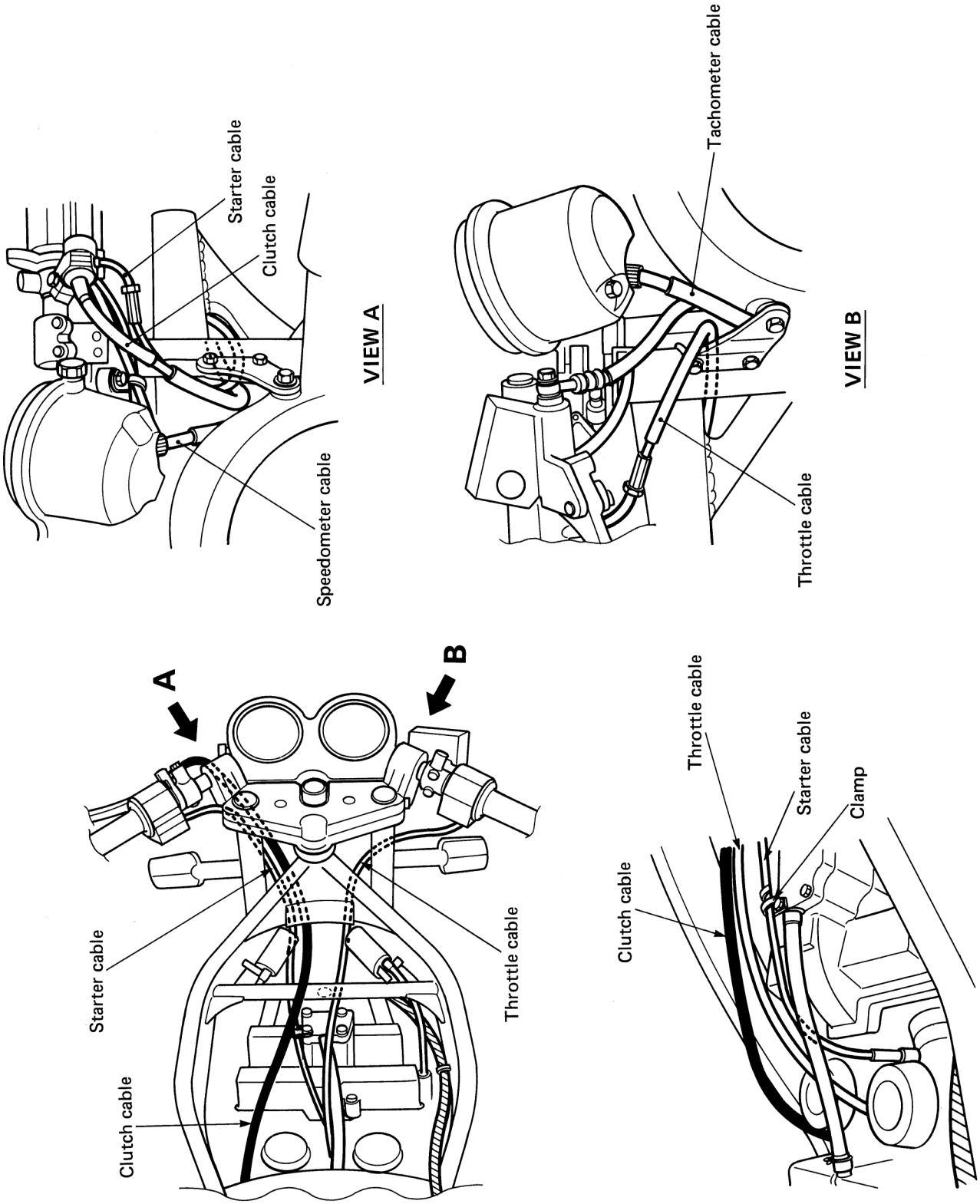
ENGINE LEAD WIRES



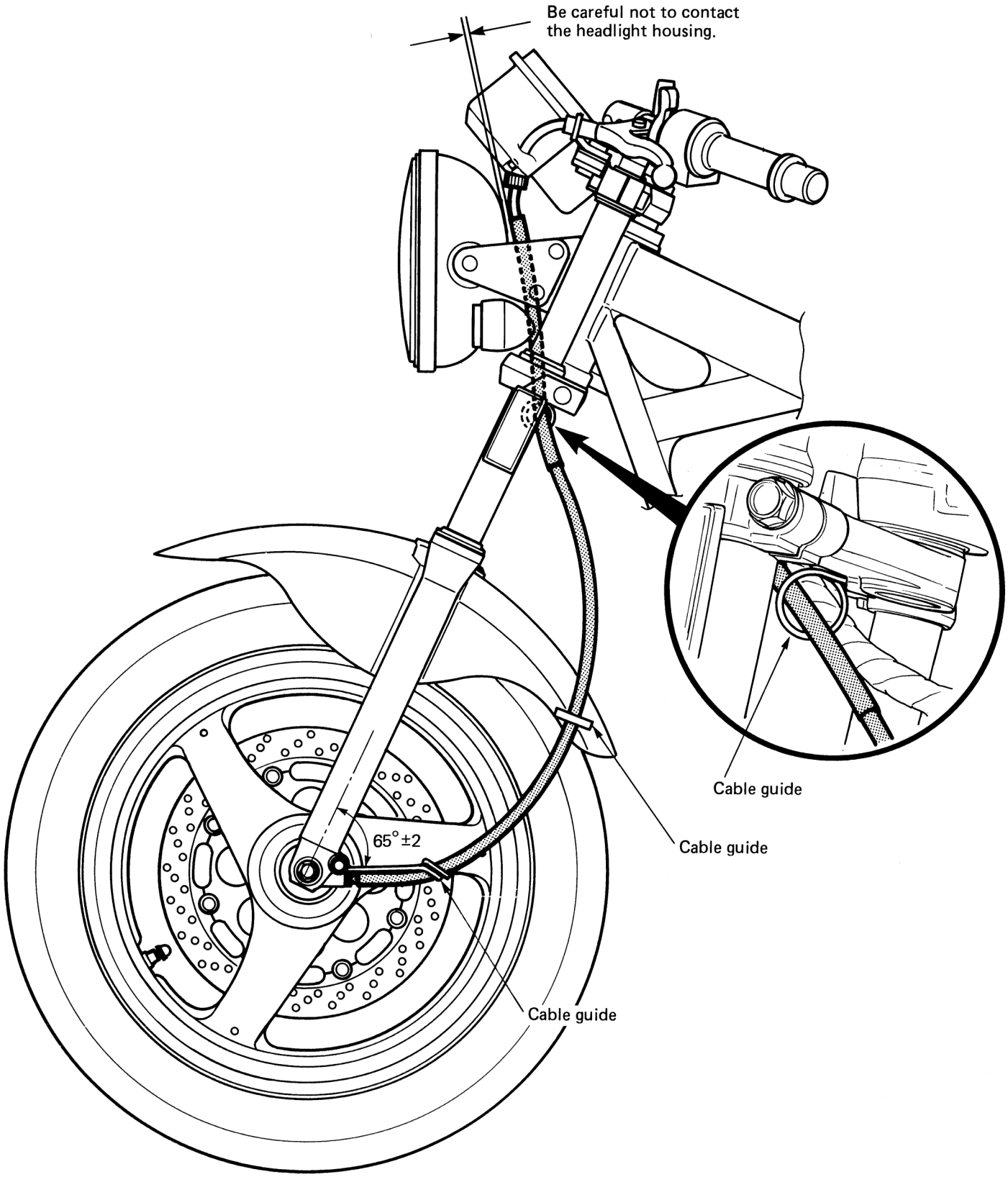
HIGH TENSION CORD ROUTING



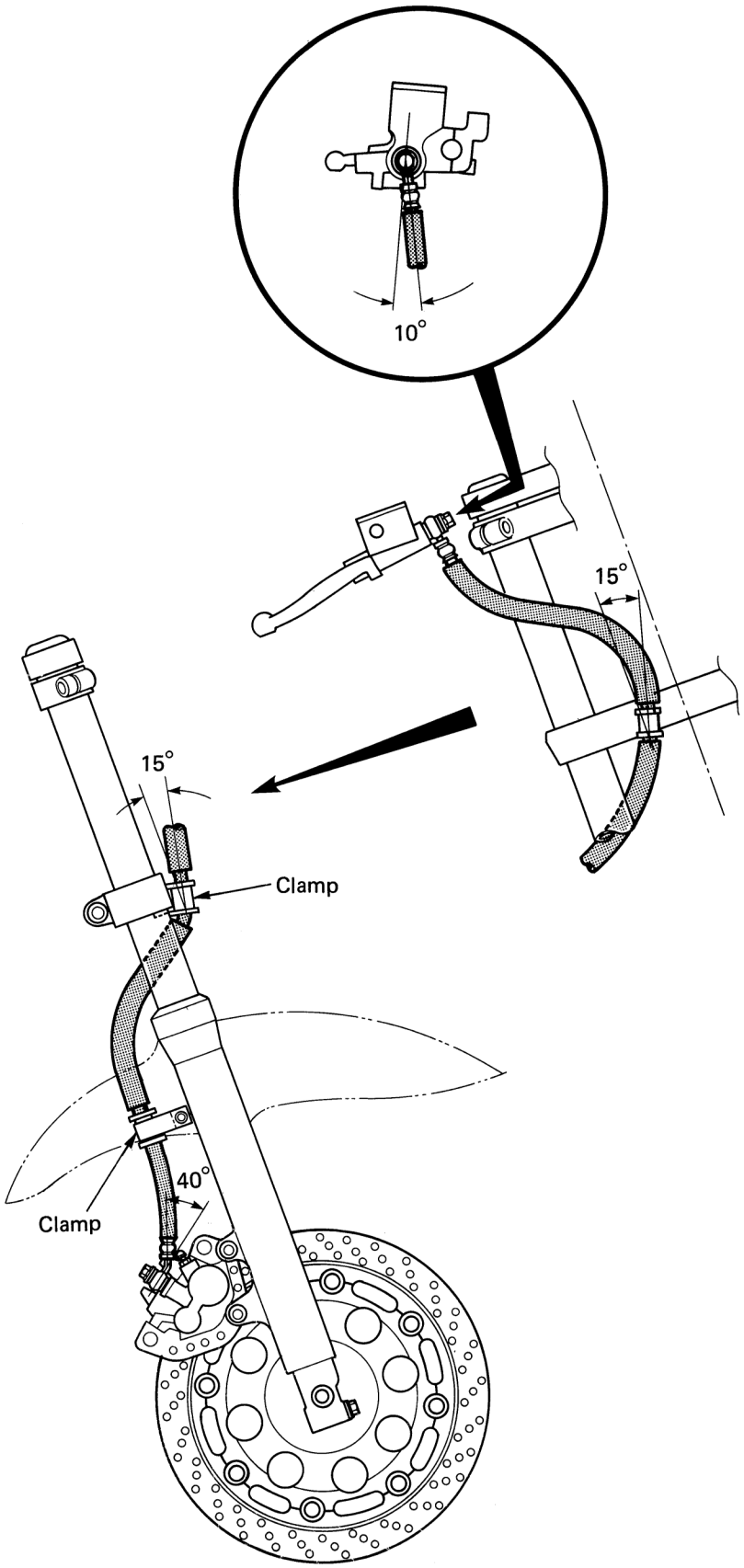
CABLE ROUTING



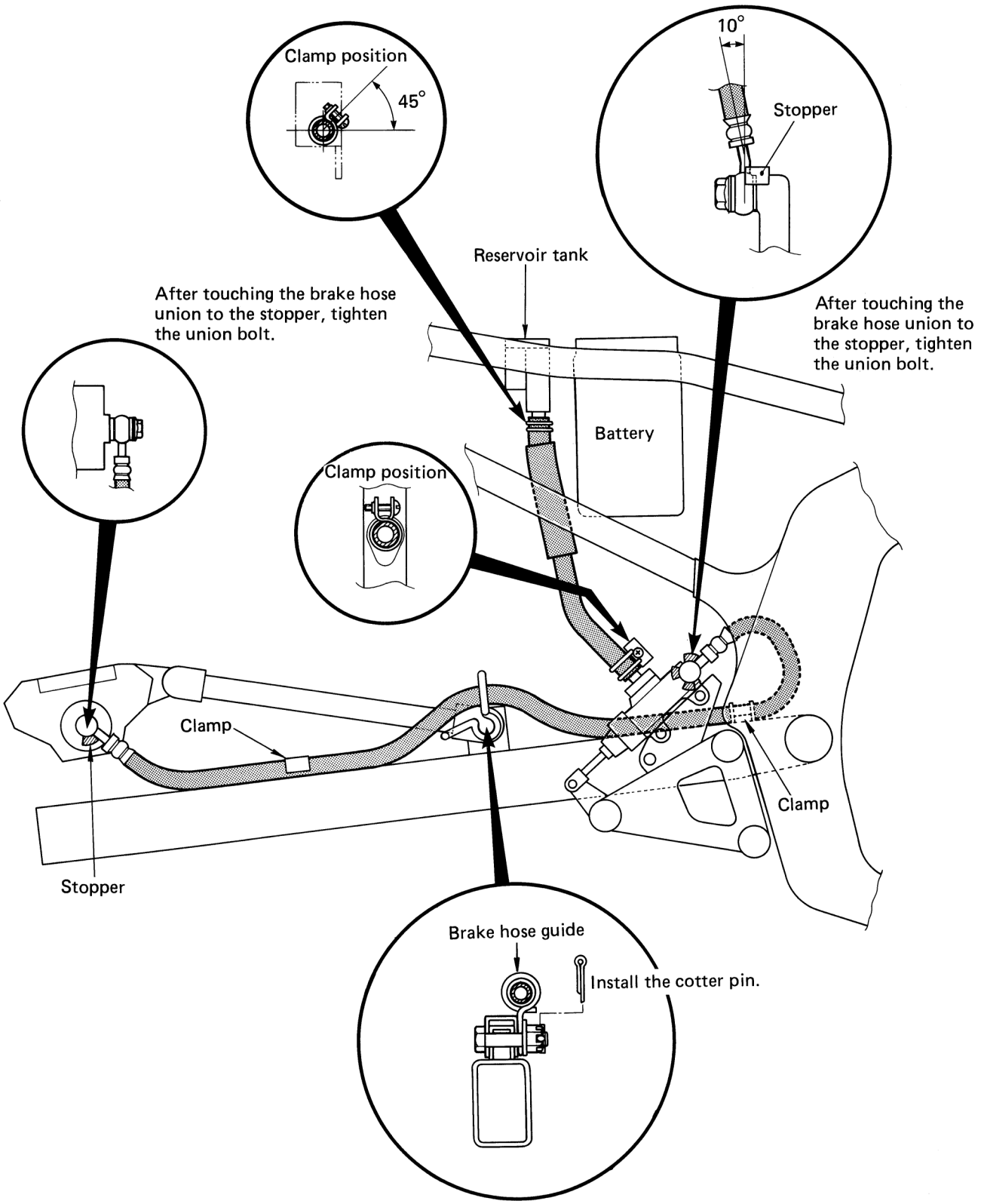
SPEEDOMETER CABLE ROUTING



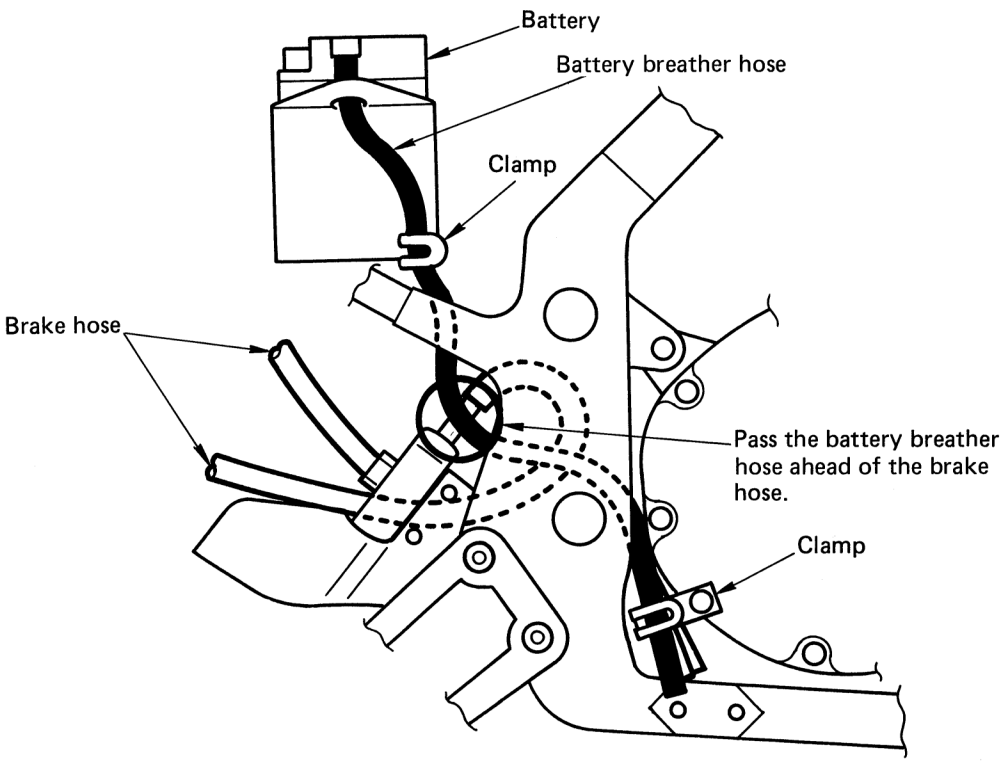
FRONT BRAKE HOSE ROUTING



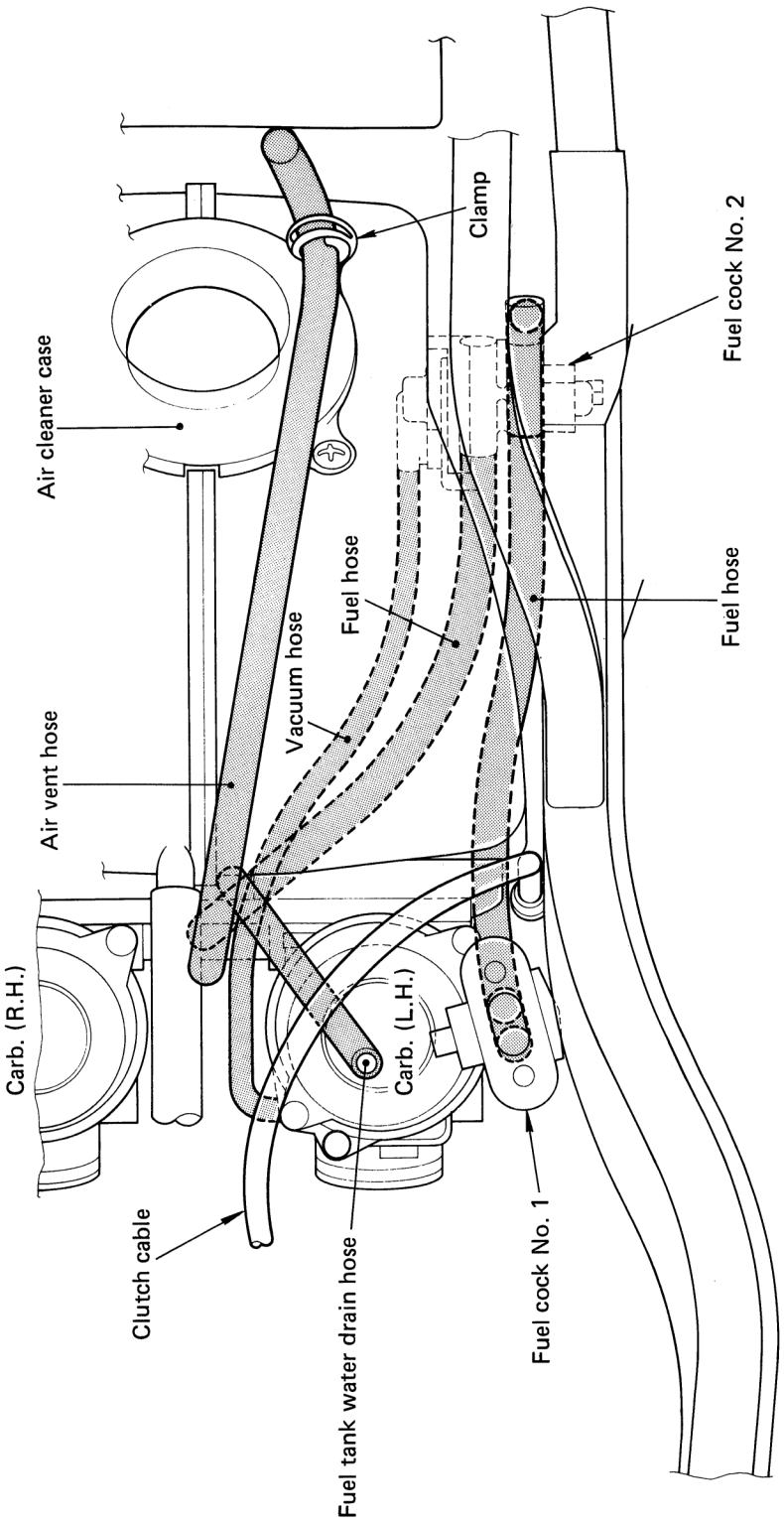
REAR BRAKE HOSE ROUTING



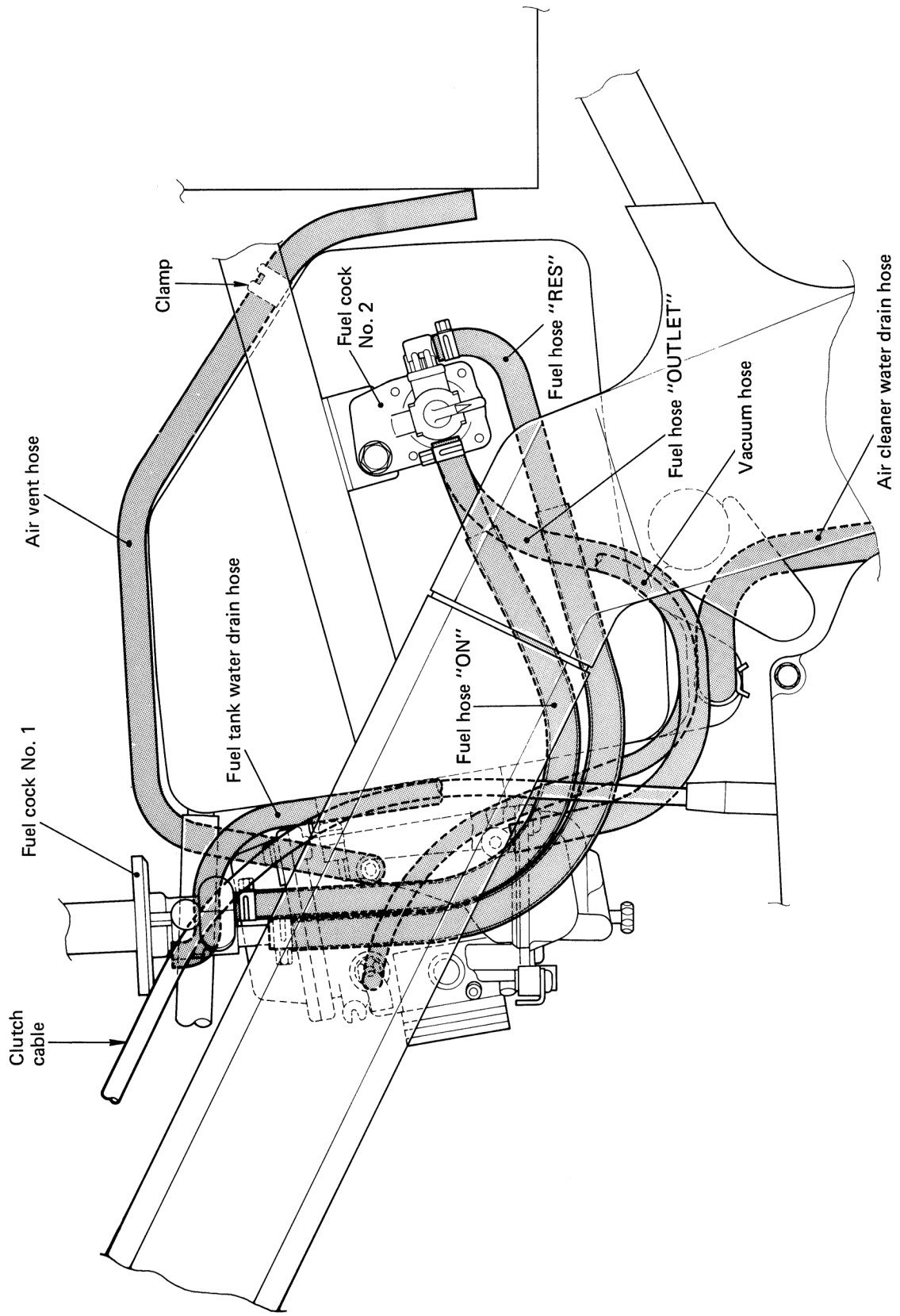
BATTERY BREATHER HOSE ROUTING



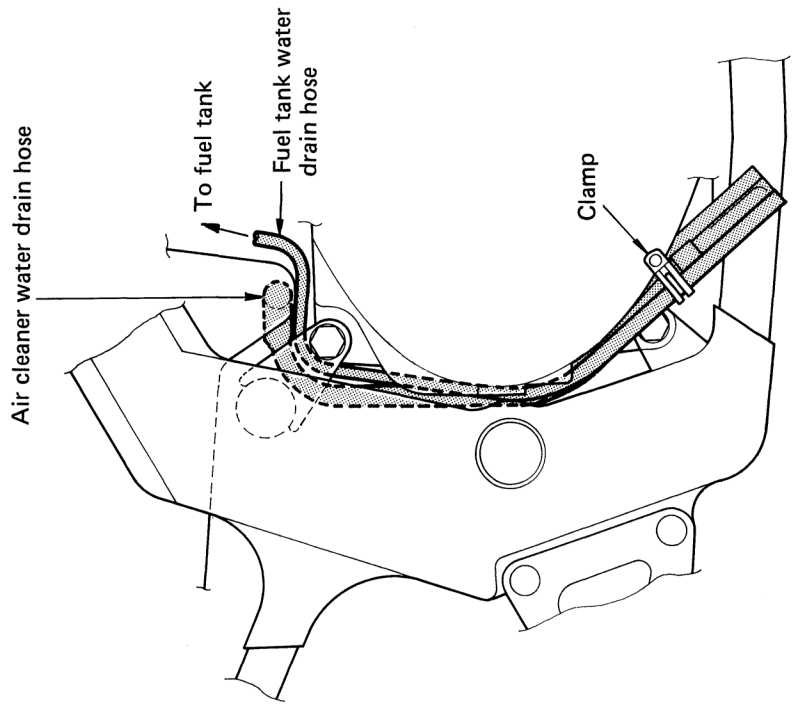
FUEL HOSE, VACUUM HOSE AND AIR VENT HOSE ROUTING

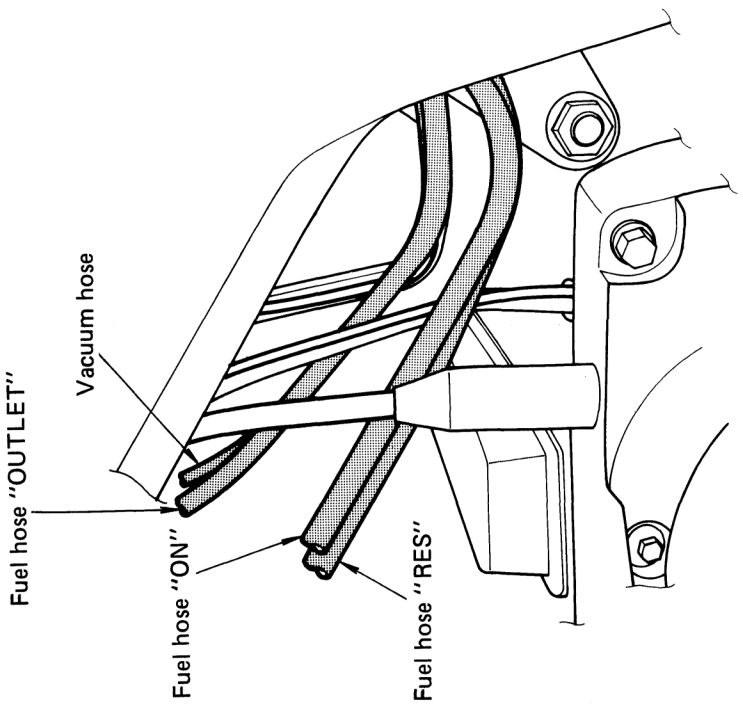


FUEL HOSE ROUTING

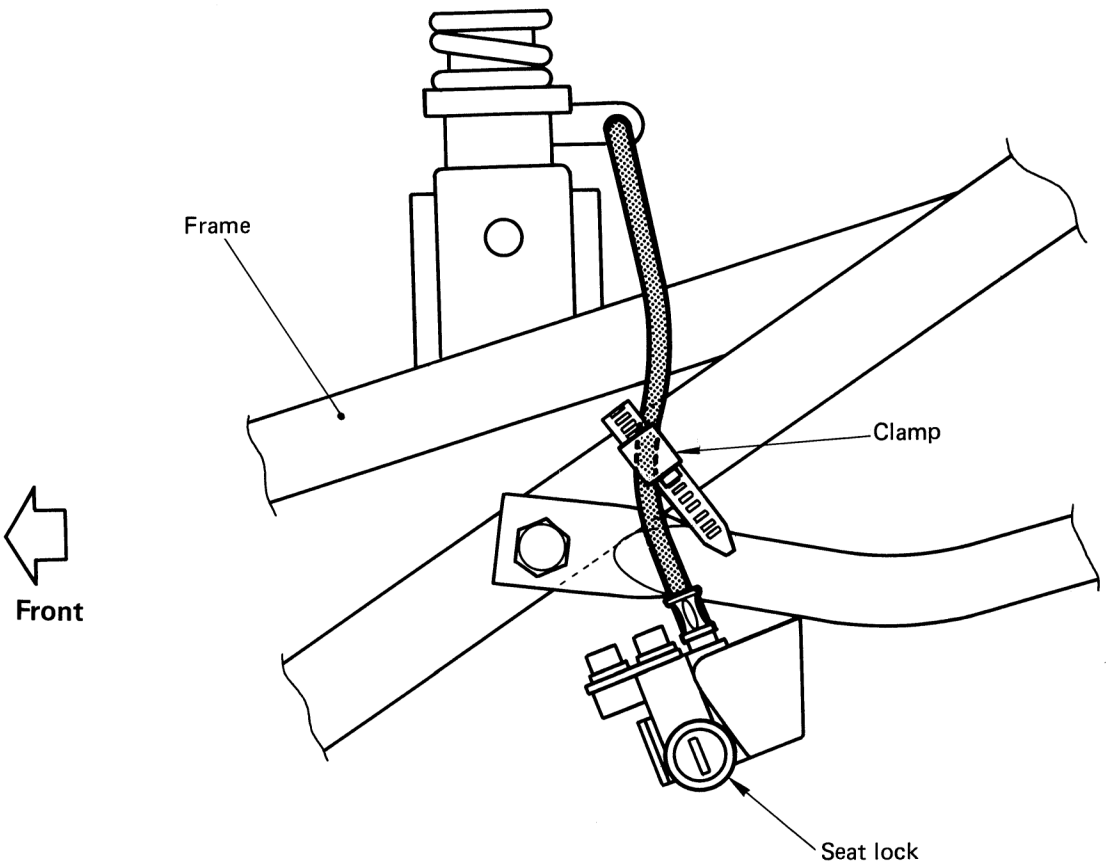


FUEL HOSE, AIR CLEANER WATER DRAIN HOSE AND FUEL TANK WATER DRAIN HOSE ROUTING

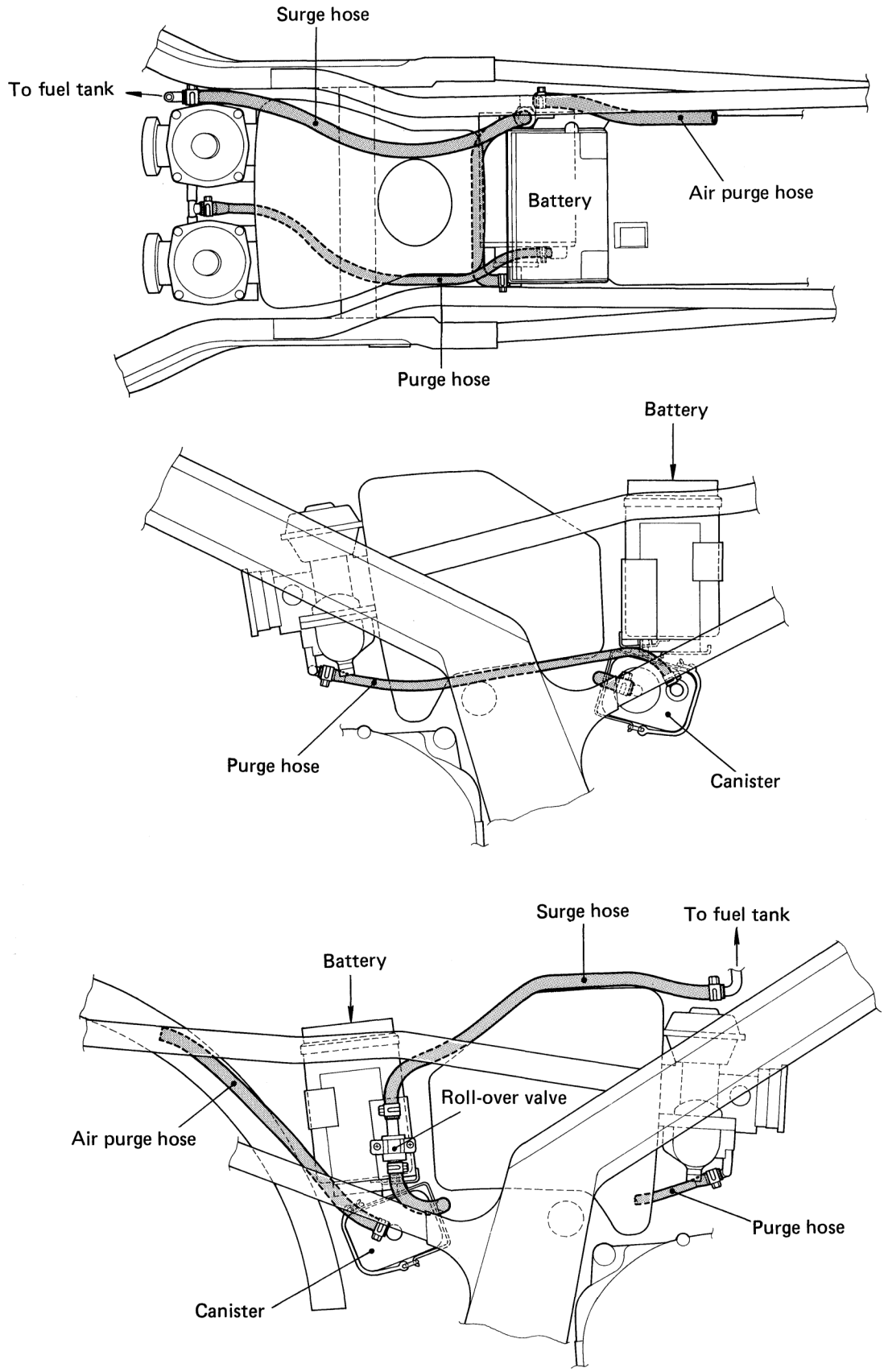




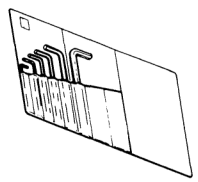
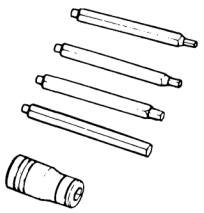
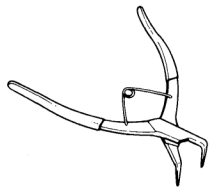
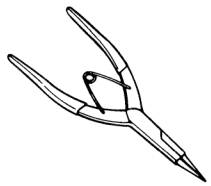
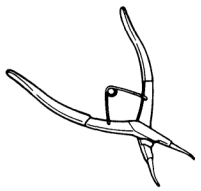
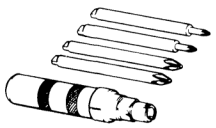
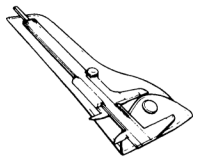
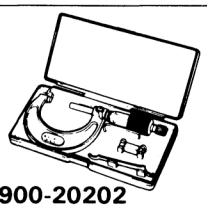
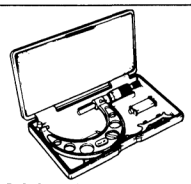
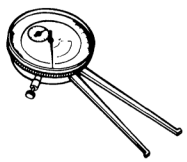
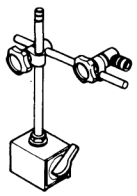
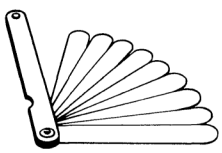
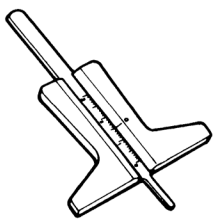
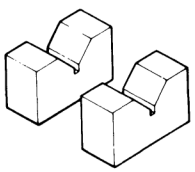
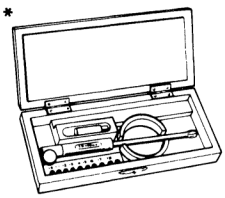
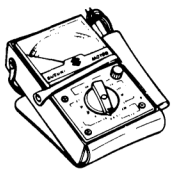
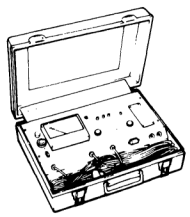
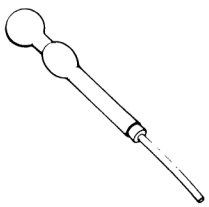
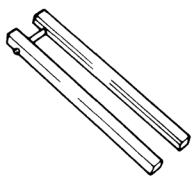
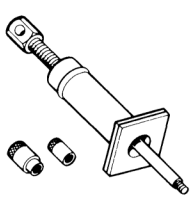
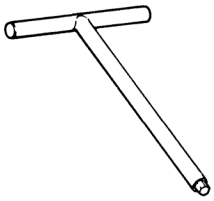
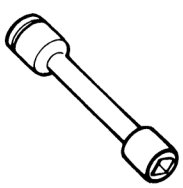
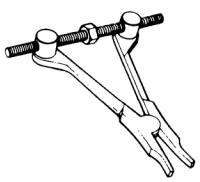
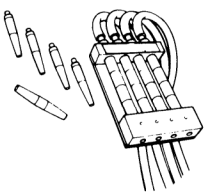
SEAT LOCK CABLE ROUTING

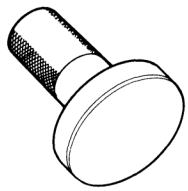
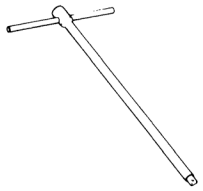
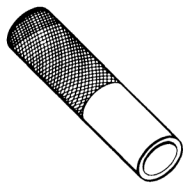
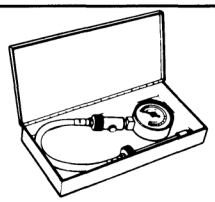
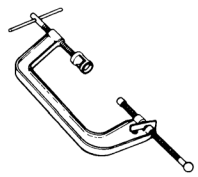
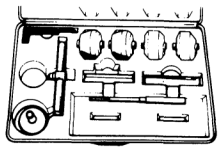
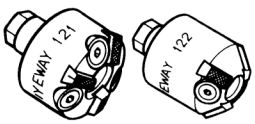
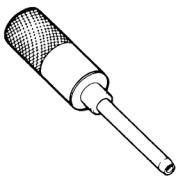
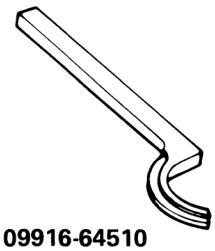
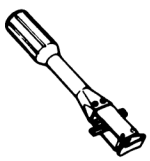
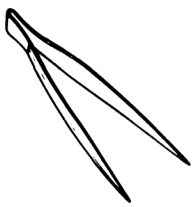
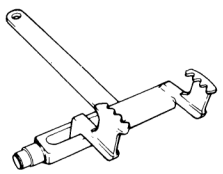
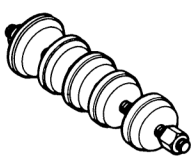
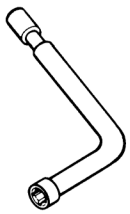
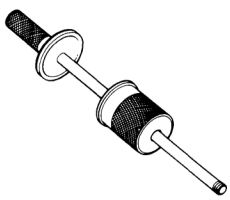
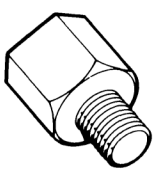
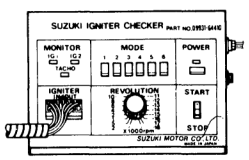
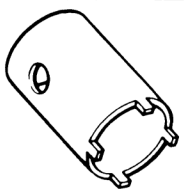
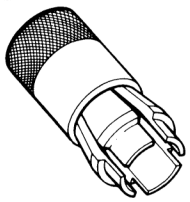


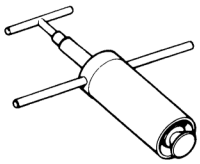
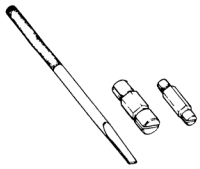
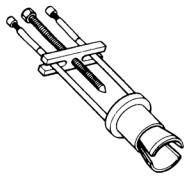
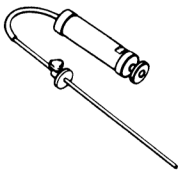
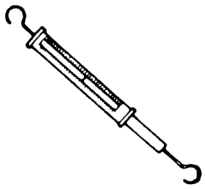
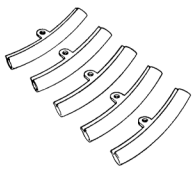
CANISTER HOSE ROUTING
(For CALIFORNIA model)



SPECIAL TOOLS

 09900-00401 "L" type hexagon wrench set	*  09900-00410 Hexagon wrench set	 09900-06105 Snap ring pliers	 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers
 09900-09003 Impact driver set	 09900-20102 Vernier calipers (1/20 mm, 200 mm)	 09900-20202 Micrometer (1/100 mm, 25-50 mm)	 09900-20203 Micrometer (1/100 mm, 50-75 mm)	 09900-20205 Micrometer (1/1000 mm, 0-25 mm)
 09900-20508 Cylinder gauge set (1/100 mm , 40-80 mm)	 09900-20602 Dial gauge (1/1000 mm, 1mm)	*  09900-20605 Dial calipers (1/100 mm, 10-34 mm)	 09900-20606 Dial gauge (1/100 mm, 10 mm)	*  09900-20701 Magnetic stand
* 09900-20702 Micrometer stand	 09900-20803 Thickness gauge	*  09900-20805 Tire depth gauge	*  09900-21304 V-block set (100 mm)	* 09900-22301 Plastigauge
*  09900-22403 Small bore gauge (18-35 mm)	 09900-25002 Pocket tester	 09900-28106 Electro tester	 09900-28403 Hydrometer	 09910-20116 Conrod stopper
 09910-34510 Piston pin puller	 09911-73730 "T" type hexagon wrench (5 mm)	 09911-74510 Long socket (14 mm)	 09912-34510 Cylinder disassembler	 09913-13121 Carburetor balancer

 09913-75520 Bearing installer	 09914-24510 T-handle	 09914-25811 "T" type hexagon wrench (6 mm)	 09914-79610 Bearing and oil seal installer	 09915-64510 Compression gauge 09915-63210 (Adaptor)
 09915-74510 Oil pressure gauge 09915-77330(Meter)	 09916-14510 Valve lifter	 09916-24900 Valve seat cutter set	 See page 3-22. Valve seat cutter head 45°, 15° and 75°	 09916-34520 Valve guide reamer (7 mm)
 09916-34531 Valve guide reamer (12.3 mm)	 09916-34541 Valve guide reamer handle	 09916-44511 Valve guide remover	 09916-54531 Attachment	 09916-57321 Valve guide installer handle
 09916-64510 Tappet depressor	 09916-74521 Piston ring compressor body	 09916-74540 Piston ring compressor band (63-75 mm)	 09916-84510 Tweezers	 09920-53710 Clutch sleeve hub holder
 09923-73210 Bearing puller (17-20 mm)	 09924-84510 Bearing installer set	 09930-11910 Torx wrench	 09930-14530 Universal joint	 09930-30102 Sliding shaft
 09930-33710 Rotor remover attachment	 09930-44511 Generator rotor holder	 09931-64430 Ignitor checker (Digital type)	 09940-14911 Steering stem nut wrench	 09940-50112 Front fork oil seal installer

09941-34513 Steering outer race installer	 09941-44510 Swingarm bearing remover	 09941-50110 Bearing remover	09941-74910 Steering bearing installer	 09941-84510 Bearing remover
 09943-74111 Front fork oil level gauge	09911-94530 Attachment	 09940-92710 Spring scale	 09941-94510 Rim protector	

* : Tools asterisked on above are unavailable in U.S.A.

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt	13 – 15	1.3 – 1.5	9.5 – 11.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Cylinder head bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cylinder stud bolt	13 – 16	1.3 – 1.6	9.5 – 11.5
Camshaft journal holder bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	17 – 19	1.7 – 1.9	12.5 – 13.5
Cam chain tensioner mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Conrod bearing cap nut	30 – 34	3.0 – 3.4	21.5 – 25.0
Generator rotor mounting bolt	110 – 130	11.0 – 13.0	79.5 – 94.5
Starter clutch securing bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Signal generator bolt	17 – 23	1.7 – 2.3	12.5 – 16.5
Crankcase bolt (6 mm)	9 – 13	0.9 – 1.3	6.5 – 9.5
(8 mm)	20 – 24	2.0 – 2.4	14.5 – 17.4
Counter-balancer shaft setting bolt	35 – 45	3.5 – 4.5	25.5 – 32.5
Oil pump mounting screw	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil pressure regulator	17 – 20	1.7 – 2.0	12.5 – 14.5
Oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil pan bolt	12 – 16	1.2 – 1.6	8.5 – 11.5
Clutch sleeve hub nut	40 – 60	4.0 – 6.0	29.0 – 43.5
Clutch spring set bolt	4 – 6	0.4 – 0.6	3.0 – 4.5
Exhaust pipe bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Muffler mounting bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Engine mounting bolt	60 – 72	6.0 – 7.2	43.5 – 52.0

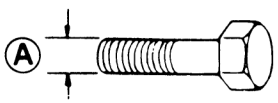
CHASSIS

Item		N·m	kg-m	lb-ft
Steering stem head bolt		35 – 55	3.5 – 5.5	25.5 – 40.0
Front fork upper clamp bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Front fork lower clamp bolt		25 – 40	2.5 – 4.0	18.0 – 29.0
Front axle nut	Normal nut with cotter pin	36 – 52	3.6 – 5.2	26.0 – 37.5
	Self-lock nut	40 – 58	4.0 – 5.8	29.0 – 42.0
Front axle pinch bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Handlebar set bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
Handlebar holder mounting nut		27 – 42	2.7 – 4.2	19.5 – 30.5
Front brake master cylinder mounting bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
Front brake caliper mounting bolt		30 – 48	3.0 – 4.8	21.5 – 35.0
Front brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
Brake hose union bolt		15 – 20	1.5 – 2.0	11.0 – 14.5
Air bleeder valve		6 – 9	0.6 – 0.9	4.5 – 6.5
Front and rear disc bolt		18 – 28	1.8 – 2.8	13.0 – 20.0
Swingarm pivot nut		55 – 88	5.5 – 8.8	40.0 – 63.5
Rear shock absorber upper/lower mounting nut		40 – 60	4.0 – 6.0	29.0 – 43.5
Rear cushion lever mounting nut		70 – 100	7.0 – 10.0	50.5 – 72.5
Rear cushion lever rod mounting nut (Upper & Lower)		70 – 100	7.0 – 10.0	50.5 – 72.5
Rear brake caliper mounting bolt		20 – 31	2.0 – 3.1	14.5 – 22.5
Rear brake caliper housing bolt		30 – 36	3.0 – 3.6	21.5 – 26.0
Torque link nut (Front & Rear)		22 – 35	2.2 – 3.5	16.0 – 25.5
Rear brake master cylinder mounting bolt		8 – 12	0.8 – 1.2	6.0 – 8.5
Rear axle nut	Normal nut with cotter pin	50 – 80	5.0 – 8.0	36.0 – 58.0
	Self-lock nut	60 – 96	6.0 – 9.6	43.5 – 69.5
Rear sprocket nut		40 – 60	4.0 – 6.0	29.0 – 43.5

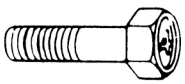
TIGHTENING TORQUE CHART

For other bolts and nuts not listed previously, refer to each tightening torque value in the following chart:

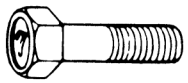
Bolt Diameter (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1—2	0.1—0.2	0.7—1.5	1.5—3	0.15—0.3	1.0—2.0
5	2—4	0.2—0.4	1.5—3.0	3—6	0.3—0.6	2.0—4.5
6	4—7	0.4—0.7	3.0—5.0	8—12	0.8—1.2	6.0—8.5
8	10—16	1.0—1.6	7.0—11.5	18—28	1.8—2.8	13.0—20.0
10	22—35	2.2—3.5	16.0—25.5	40—60	4.0—6.0	29.0—43.5
12	35—55	3.5—5.5	25.5—40.0	70—100	7.0—10.0	50.5—72.5
14	50—80	5.0—8.0	36.5—58.0	110—160	11.0—16.0	79.5—115.5
16	80—130	8.0—13.0	58.0—94.0	170—250	17.0—25.0	123.0—181.0
18	130—190	13.0—19.0	94.0—137.5	200—280	20.0—28.0	144.5—202.5



Conventional Bolt



"4" Marked Bolt



"7" Marked Bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	39 (1.5)	———
	EX.	32 (1.3)	———
Valve lift	IN.	8.5 (0.33)	———
	EX.	8.0 (0.31)	———
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	———
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	———
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	———
	EX.	6.945—6.960 (0.2734—0.2740)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	———	35.6 (1.40)
	OUTER	———	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	———
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
	EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	———

ITEM	STANDARD		LIMIT
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm^2, 28 psi) Below 500 kPa (5.0 kg/cm^2, 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.2)	———
Clutch release screw	1/4 – 1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		———
Final reduction ratio		2.437 (39/16)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.777 (32/18)		———
	3rd	1.380 (29/21)		———
	4th	1.125 (27/24)		———
	5th	0.961 (25/26)		———
	Top	0.851 (23/27)		———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		114.7 $\pm \frac{0.1}{0}$ (4.516 $\pm \frac{0.004}{0}$)		———
Drive chain		Type	D.I.D.: DID520V6	———
		Links	110	———
		20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		———

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST33SS	←
Bore size	33 mm	←
I.D. No.	01D00	01D10
Idle r/min.	1 200 ± 100 r/min.	←
Float height	14.6 ± 1.0 mm	←
Main jet (M.J.)	#122.5	←
Main air jet (M.A.J)	0.5 mm	←
Jet needle (J.N.)	5DH8	←
Needle jet (N.J.)	O-3	←
Throttle valve (Th.V.)	#120	←
Pilot jet (P.J.)	#37.5	←
By-pass (B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	1.5 mm	←
Starter jet (G.S.)	#42.5	←
Pilot screw (P.S.)	PRE-SET	←
Pilot air jet (P.A.J.)	1.3 mm	1.35 mm
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION					
		E-01,16 17,28	E-02,04, 15,21,25, 34,53	E-24	E-22	E-22 (GS500E-U)	E-39
Carburetor type		MIKUNI BST33SS	←	←	←	←	←
Bore size		33 mm	←	←	←	←	←
I.D. No.		01D20	01D30	01D50	01D70	01D60	01D80
Idle r/min.		1200± 100 r/min	←	←	←	←	←
Float height		14.6± 1.0 mm	←	←	←	←	←
Main jet	(M.J.)	#122.5	#120	←	←	#135	#120
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	5DH9-4th	5DH9-3rd
Needle jet	(N.J.)	O-2	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	←	←	←	←	←
Pilot air jet	(P.A.J.)	1.3 mm	←	←	←	←	←
Throttle cable play		0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal-Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20A		

WATTAGE

Unit: W

ITEM		SPECIFICATION	
		E-03, 28, 33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		47 (1.9)	———
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	———
	Rear	12.700–12.743 (0.5000–0.5017)	———
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4994)	———
	Rear	12.657–12.684 (0.4983–0.4994)	———
Brake caliper cylinder bore	Front	27.000–27.076 (1.0630–1.0660)	———
		33.960–34.036 (1.3370–1.3400)	———
	Rear	38.180–38.256 (1.5031–1.5061)	———
Brake caliper piston diam.	Front	26.920–26.970 (1.0598–1.0618)	———
		33.884–33.934 (1.3340–1.3360)	———
	Rear	38.098–38.148 (1.4999–1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	110/70-17 54H	———
	Rear	130/70-17 62H	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	254 (10.0)	
Front fork oil level	99 (3.9)	———	
Rear shock absor ber spring adjuster	4th/7	———	
Rear wheel travel	115 (4.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$) or 89 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 33
	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended.		The others
Fuel tank including reserve	17.0 L (4.5/3.7 US/Imp gal)		
reserve	3.5 L (3.7/3.1 US/Imp qt)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		
Brake fluid type	DOT 4		

FOREWORD

This section describes service data and service specifications which differ from those of the GS500EK ('89-model).

NOTE:
- *Any differences between "K" ('89-model) and "L" ('90-model) in specifications and service data are clearly indicated with the asterisk marks (*).*
- *Please refer to the section 1 through 7 for details which are not given in this section.*

CONTENTS

SPECIFICATIONS 8- 1
SERVICE DATA 8- 3
WIRING DIAGRAM 8-11
WIRE ROUTING 8-13
CABLE ROUTING 8-15

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	*2 095 mm (82.5 in)	E-17
	*2 105 mm (82.9 in)	E-25
	*2 180 mm (85.8 in)	E-15, 16 and 22
	2 075 mm (81.7 in)	The others
Overall width	* 755 mm (29.7 in)	
Overall height	1 045 mm (41.1 in)	
Wheelbase	1 410 mm (55.5 in)	
Ground clearance	155 mm (6.1 in)	
Seat height	790 mm (31.1 in)	
Dry mass	169 kg (373 lbs)	

ENGINE

Type	Four-stroke, air-cooled, DOHC, TDCC
Valve clearance (IN & EX)	0.03 – 0.08 mm (0.0018 – 0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Caburetor	MIKUNI BST33SS, twin
Air cleaner	Polyester fiber element
Starter system	Electric starter motor
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DAIDO DID. 520V_6, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Link type suspension system, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless

ELECTRICAL

Ignition type	Fully Transistorized
Ignition timing	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min 5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min E-33
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . . . Except for E-03, 28 and 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal) 15.0 L (4.0/3.3 US/Imp gal) E-33
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz)

- These specifications are subject to change without notice.
- Asterisk mark (*) indicates the new L model specifications.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to valve stem clearance	IN.	0.025 – 0.055 (0.0010 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000 – 7.015 (0.2756 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9 – 12.5 kg (24.0 – 27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3 – 23.3 kg (44.8 – 51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.789 – 36.819 (1.4484 – 1.4496)	36.49 (1.437)
	EX.	36.291 – 36.321 (1.4288 – 1.4300)	36.00 (1.417)
Camshaft journal oil clearance	IN. & EX.	0.032 – 0.066 (0.0013 – 0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980 (0.8645 – 0.8654)	—

ITEM	STANDARD		LIMIT
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000 – 1 400 kPa (10 – 14 kg/cm², 142 – 199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	74.000 – 74.015 (2.9134 – 2.9140)			74.080 (2.9165)
Piston diam.	73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10 – 0.25 (0.004 – 0.010)	0.70 (0.028)
	2nd		0.10 – 0.25 (0.004 – 0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	
	2nd		1.21 – 1.23 (0.047 – 0.048)	
	Oil		2.51 – 2.53 (0.099 – 0.100)	
Piston ring thickness	1st		1.17 – 1.19 (0.046 – 0.047)	
	2nd		1.17 – 1.19 (0.046 – 0.047)	
Piston pin bore	18.002 – 18.008 (0.7087 – 0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995 – 18.000 (0.7085 – 0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm^2, 28 psi) Below 500 kPa (5.0 kg/cm^2, 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.2)	———
Clutch release screw	1/4 — 1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		———
Final reduction ratio		2.437 (39/16)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.777 (32/18)		———
	3rd	1.380 (29/21)		———
	4th	1.125 (27/24)		———
	5th	0.961 (25/26)		———
	Top	0.851 (23/27)		———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		114.7 $\pm \frac{0.1}{0}$ (4.516 $\pm \frac{0.004}{0}$)		———
Drive chain		Type	D.I.D.: DID520V6	———
		Links	110	———
		20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		———

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST33SS	←
Bore size	33 mm	←
I.D. No.	01D00	01D10
Idle r/min.	1 200 ± 100 r/min.	←
Float height	14.6 ± 1.0 mm	←
Main jet (M.J.)	#122.5	←
Main air jet (M.A.J)	0.5 mm	←
Jet needle (J.N.)	5DH8	←
Needle jet (N.J.)	O-3	←
Throttle valve (Th.V.)	#120	←
Pilot jet (P.J.)	#37.5	←
By-pass (B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	1.5 mm	←
Starter jet (G.S.)	#42.5	←
Pilot screw (P.S.)	PRE-SET	←
Pilot air jet (P.A.J.)	1.3 mm	1.35 mm
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION					
		E-01,16 17,28	E-02,04, 15,21,25, 34,53	E-24	E-22	E-22 (GS500E-U)	E-39
Carburetor type		MIKUNI BST33SS	←	←	←	←	←
Bore size		33 mm	←	←	←	←	←
I.D. No.		01D20	01D30	01D50	01D70	01D60	01D80
Idle r/min.		1200± 100 r/min	←	←	←	←	←
Float height		14.6± 1.0 mm	←	←	←	←	←
Main jet	(M.J.)	#122.5	#120	←	←	#135	#120
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	5DH9-4th	5DH9-3rd
Needle jet	(N.J.)	O-2	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	←	←	←	←	←
Pilot air jet	(P.A.J.)	1.3 mm	←	←	←	←	←
Throttle cable play		0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal-Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20A		

WATTAGE

Unit: W

ITEM		SPECIFICATION	
		E-03, 28, 33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		47 (1.9)	———
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	———
	Rear	12.700—12.743 (0.5000—0.5017)	———
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	———
	Rear	12.657—12.684 (0.4983—0.4994)	———
Brake caliper cylinder bore	Front	27.000—27.076 (1.0630—1.0660)	———
		33.960—34.036 (1.3370—1.3400)	———
	Rear	38.180—38.256 (1.5031—1.5061)	———
Brake caliper piston diam.	Front	26.920—26.970 (1.0598—1.0618)	———
		33.884—33.934 (1.3340—1.3360)	———
	Rear	38.098—38.148 (1.4999—1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	110/70-17 54H	———
	Rear	130/70-17 62H	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	254 (10.0)	
Front fork oil level	99 (3.9)	———	
Rear shock absor ber spring adjuster	4th/7	———	
Rear wheel travel	115 (4.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

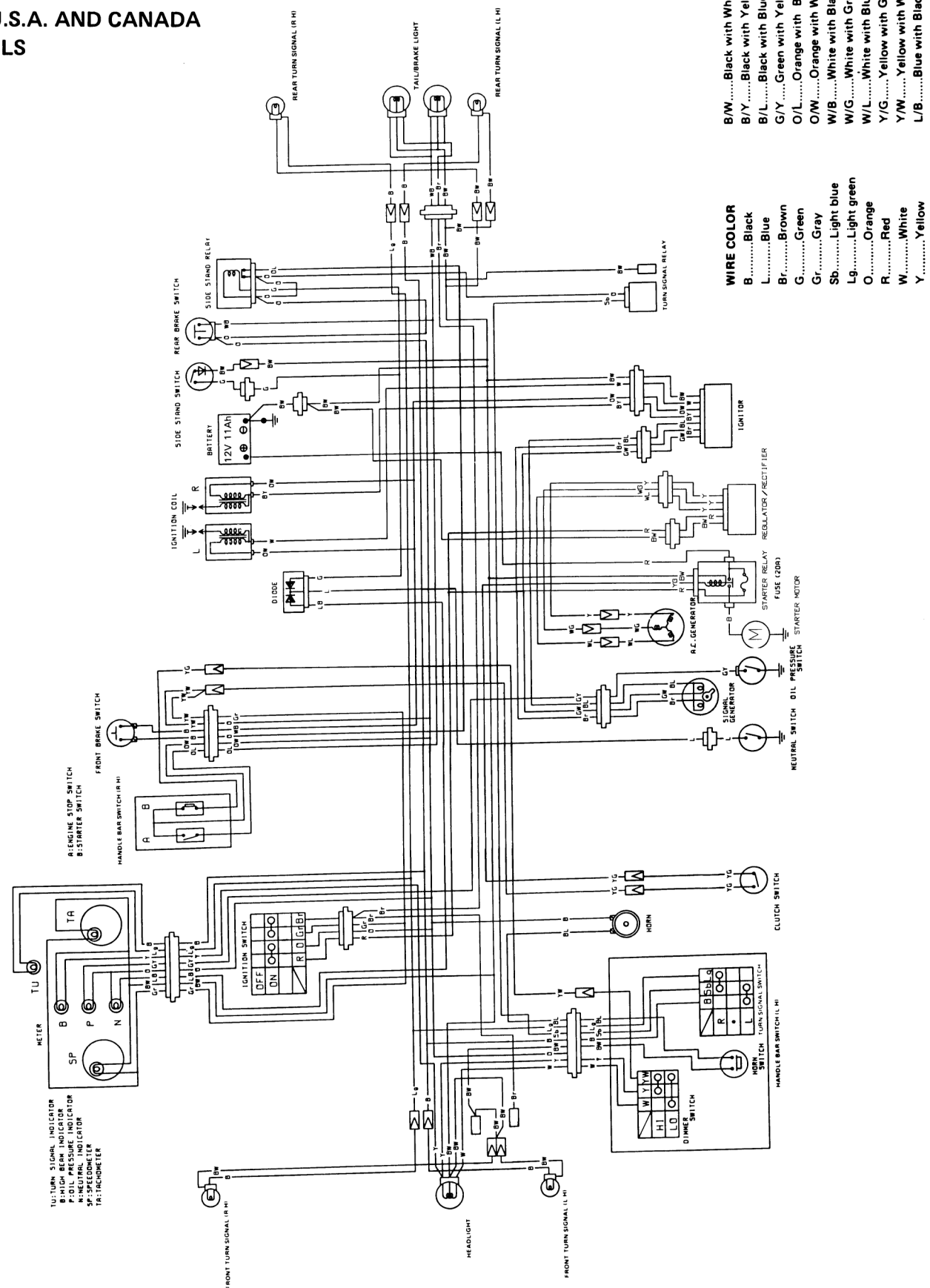
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

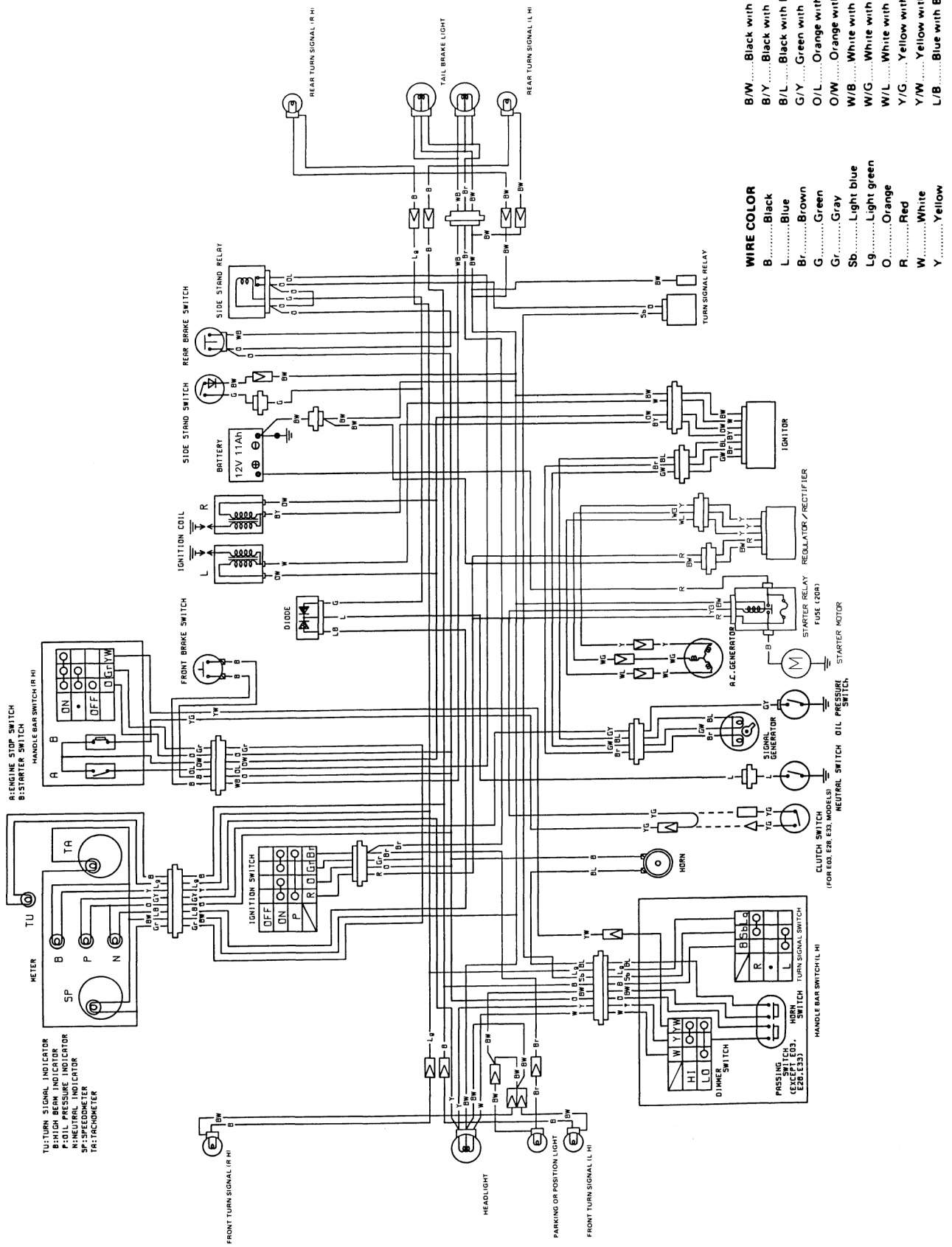
ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	17.0 L (4.5/3.7 US/Imp gal)		
reserve	3.5 L (3.7/3.1 US/Imp qt)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		
Brake fluid type	DOT 4		

WIRING DIAGRAM

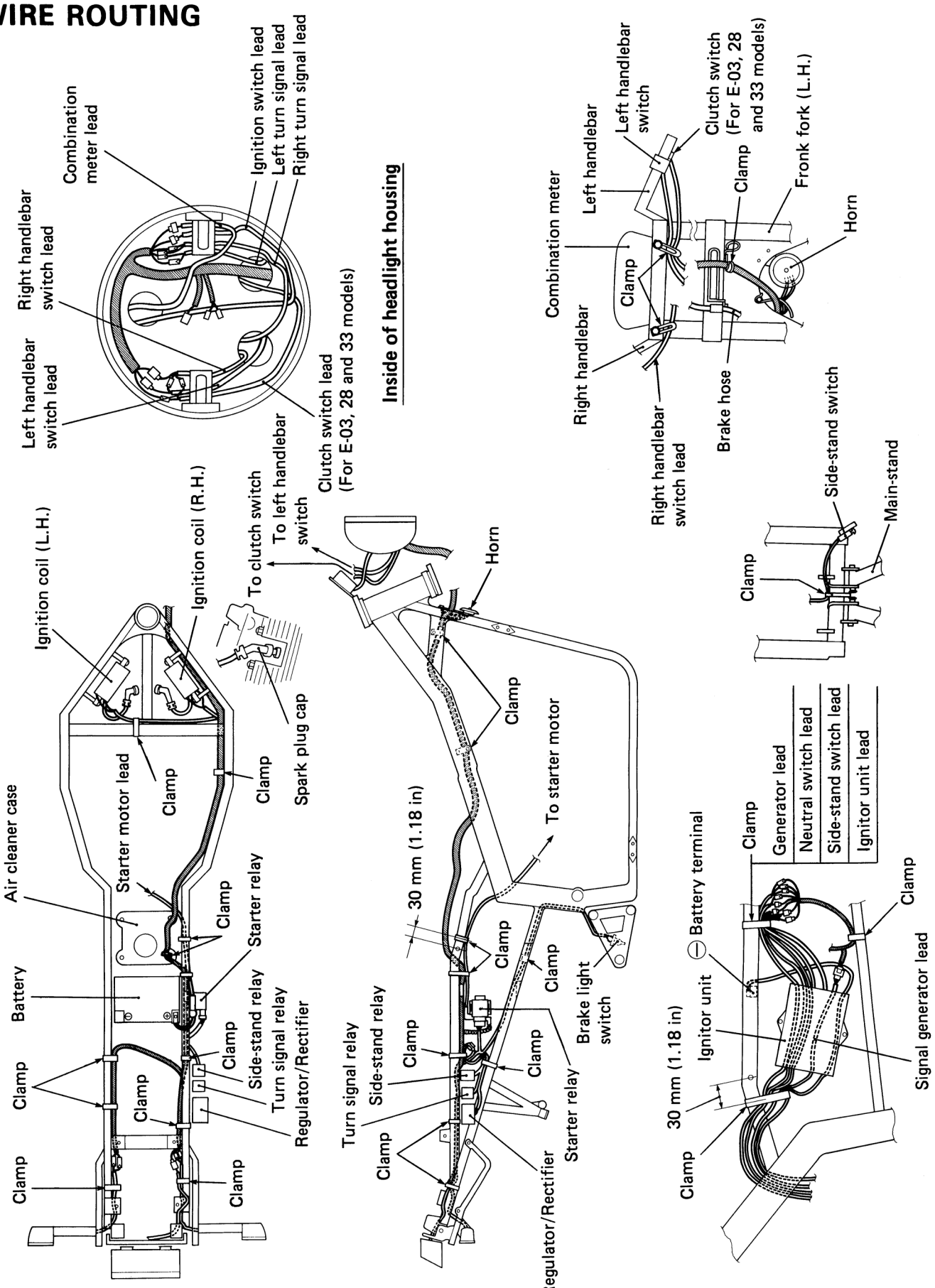
FOR U.S.A. AND CANADA MODELS

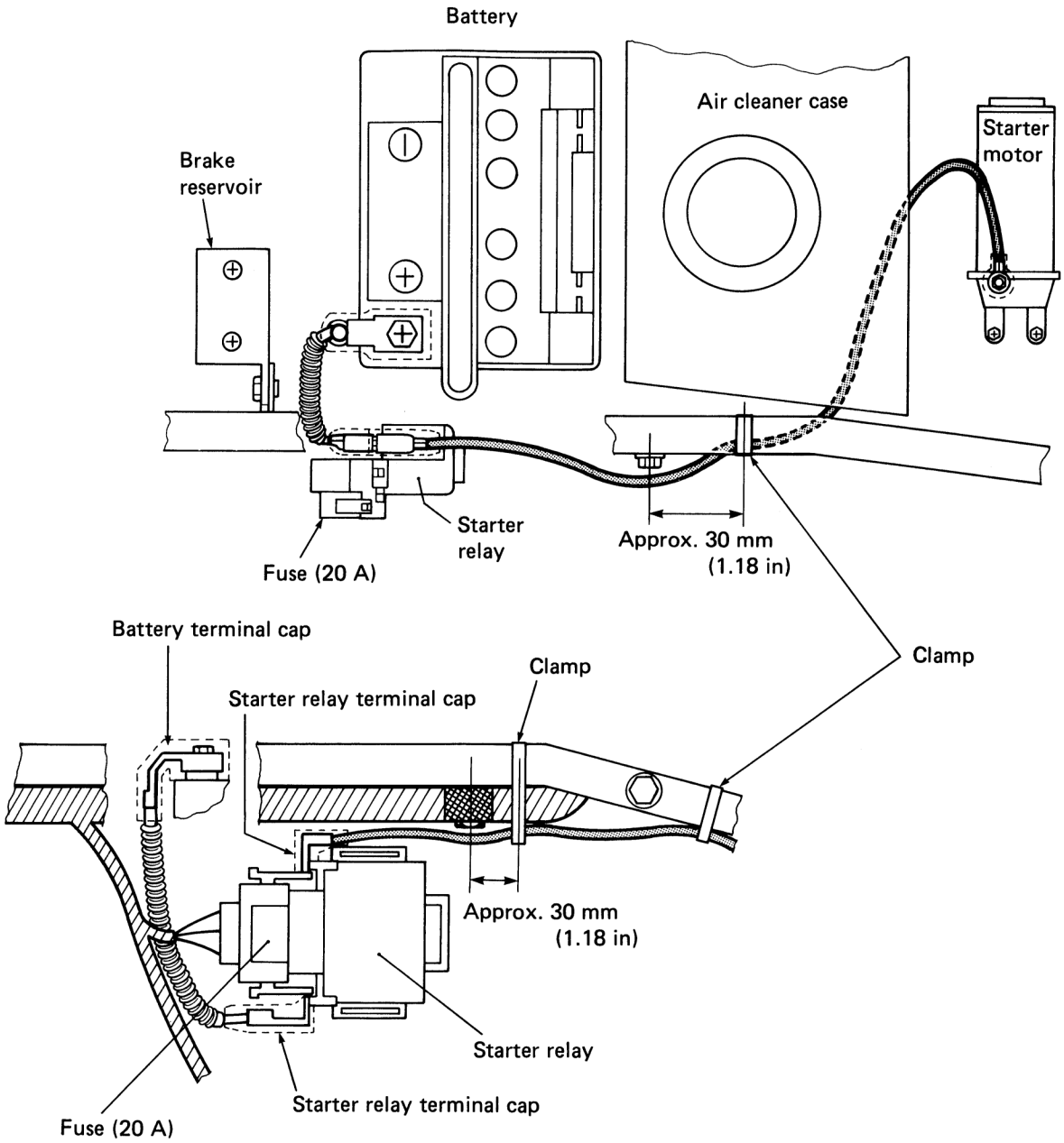


FOR OTHER MODELS

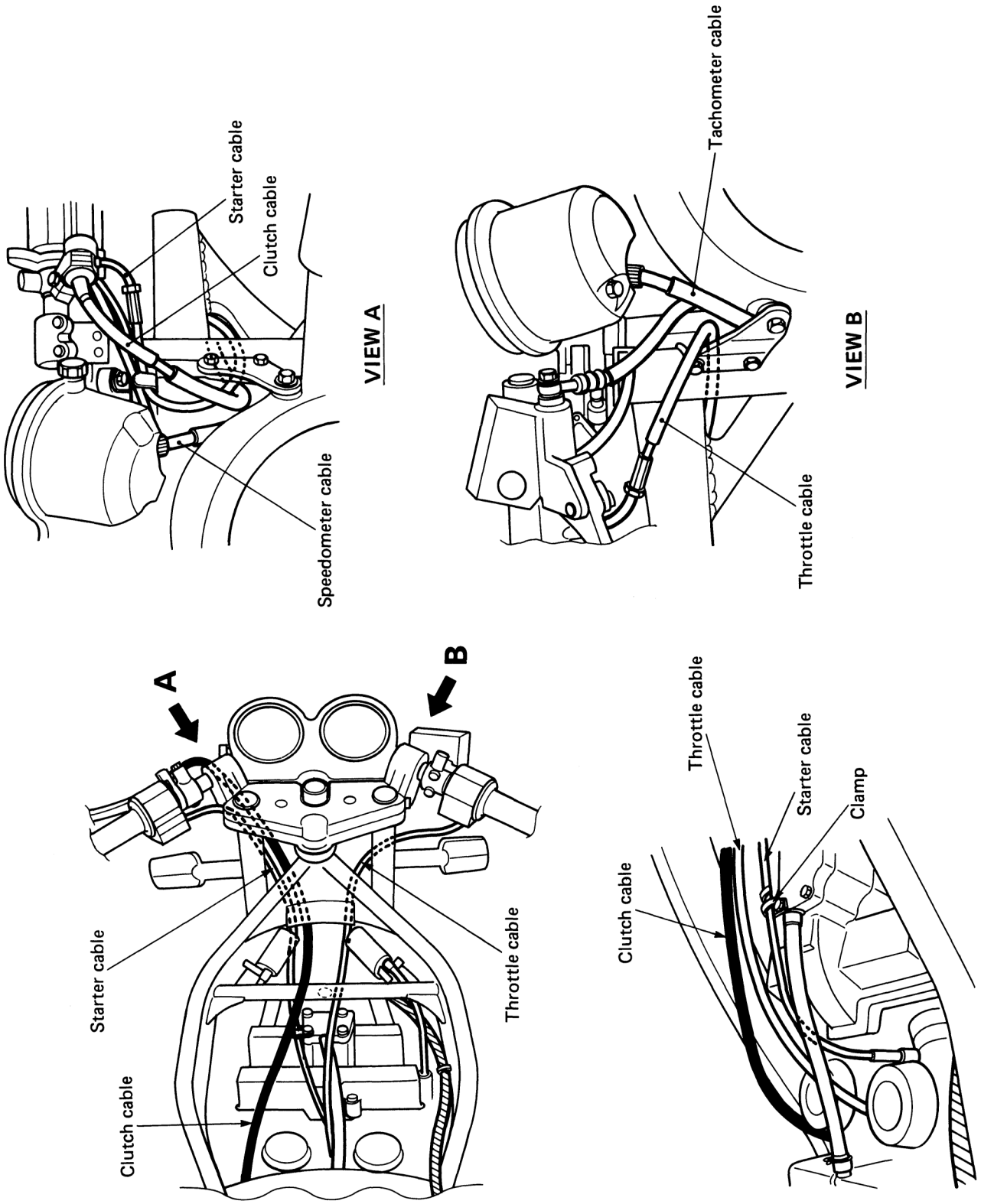


WIRE ROUTING




Battery
Air cleaner case
Starter motor
Brake reservoir
Starter relay
Fuse (20 A)
Approx. 30 mm (1.18 in)
Clamp
Battery terminal cap
Clamp
Starter relay terminal cap
Approx. 30 mm (1.18 in)
Starter relay
Starter relay terminal cap
Fuse (20 A)

CABLE ROUTING



CONTENTS

SPECIFICATIONS . . . . . 9 - 1
SERVICE DATA . . . . . 9 - 2
WIRE HARNESS, CABLE AND HOSE ROUTING . . . . . 9 -10

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 075 mm (81.7 in) 2 095 mm (82.5 in) . . . . . E17 2 105 mm (82.9 in) . . . . . E25 2 180 mm (85.8 in) E15, 16, 22
Overall width	755 mm (29.7 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	169 kg (373 lbs)
ENGINE	
Type	Four-stroke, air-cooled, DOHC, TDCC
Valve clearance (IN & EX)	0.03 – 0.08 mm (0.0012 – 0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	MIKUNI BST33SS, twin
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DAIDO DID. 520V6, 110 links
CHASSIS	
Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Full-floating suspension system, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30′
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless
ELECTRICAL	
Ignition type	Fully transistorized
Ignition timing	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min 5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . E33
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . . . Except E03, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W
CAPACITIES	
Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal) 15.0 L (4.0/3.3 US/Imp gal) E33
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.8/2.3 US/Imp qt)
with filter change	2 900 ml (3.0/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz)

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to valve stem clearance	IN.	0.025 – 0.055 (0.0010 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000 – 7.015 (0.2756 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9 – 12.5 kg (24.0 – 27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3 – 23.3 kg (44.8 – 51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.789 – 36.819 (1.4484 – 1.4496)	36.49 (1.437)
	EX.	36.291 – 36.321 (1.4288 – 1.4300)	36.00 (1.417)
Camshaft journal oil clearance	IN. & EX.	0.032 – 0.066 (0.0013 – 0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980 (0.8645 – 0.8654)	—

ITEM	STANDARD		LIMIT
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000 – 1 400 kPa (10 – 14 kg/cm², 142 – 199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	74.000 – 74.015 (2.9134 – 2.9140)			74.080 (2.9165)
Piston diam.	73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10 – 0.25 (0.004 – 0.010)	0.70 (0.028)
	2nd		0.10 – 0.25 (0.004 – 0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	
	2nd		1.21 – 1.23 (0.047 – 0.048)	
	Oil		2.51 – 2.53 (0.099 – 0.100)	
Piston ring thickness	1st		1.17 – 1.19 (0.046 – 0.047)	
	2nd		1.17 – 1.19 (0.046 – 0.047)	
Piston pin bore	18.002 – 18.008 (0.7087 – 0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995 – 18.000 (0.7085 – 0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006 – 18.014 (0.7089 – 0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1 – 0.2 (0.004 – 0.008)	0.3 (0.012)
Conrod big end width	22.95 – 23.00 (0.904 – 0.906)	———
Crank pin width	23.10 – 23.15 (0.909 – 0.911)	———
Conrod big end oil clearance	0.024 – 0.048 (0.0009 – 0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976 – 34.000 (1.3376 – 1.3386)	———
Crankshaft journal oil clearance	0.020 – 0.044 (0.0008 – 0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976 – 32.000 (1.2589 – 1.2598)	———
Crankshaft thrust bearing thickness	2.950 – 2.975 (0.1161 – 0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020 – 0.044 (0.0008 – 0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.976 – 32.000 (1.2589 – 1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C, 140°F)	Above 200 kPa (2.0 kg/cm^2, 28 psi) Below 500 kPa (5.0 kg/cm^2, 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.2)	———
Clutch release screw	1/4 – 1/2 turn back	———
Drive plate thickness	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
Drive plate claw width	15.8 – 16.0 (0.62 – 0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		———
Final reduction ratio		2.437 (39/16)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.777 (32/18)		———
	3rd	1.380 (29/21)		———
	4th	1.125 (27/24)		———
	5th	0.961 (25/26)		———
	Top	0.851 (23/27)		———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		114.7 $\pm \frac{0.1}{0}$ (4.516 $\pm \frac{0.004}{0}$)		———
Drive chain		Type	D.I.D.: DID520V6	———
		Links	110	———
		20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		———

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST33SS	←
Bore size	33 mm	←
I.D. No.	01D00	01D10
Idle r/min.	1 200 ± 100 r/min.	←
Float height	14.6 ± 1.0 mm	←
Main jet (M.J.)	#122.5	←
Main air jet (M.A.J)	0.5 mm	←
Jet needle (J.N.)	5DH8	←
Needle jet (N.J.)	O-3	←
Throttle valve (Th.V.)	#120	←
Pilot jet (P.J.)	#37.5	←
By-pass (B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	1.5 mm	←
Starter jet (G.S.)	#42.5	←
Pilot screw (P.S.)	PRE-SET	←
Pilot air jet (P.A.J.)	1.3 mm	1.35 mm
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM	SPECIFICATION						
	E-01,28	E-02,04, 16,21,25, 34,53	E-24	E-15,22	E-22 (GS500 E-U)	E-39	E17
Carburetor type	MIKUNI BST33SS	←	←	←	←	←	←
Bore size	33	←	←	←	←	←	←
I.D. No.	01D20	01D30	01D50	01D70	01D60	01D80	01D90
Idle r/min.	1200± 100 r/min	←	←	←	←	←	←
Float height	14.6± 1.0 mm	←	←	←	←	←	←
Main jet (M.J.)	#122.5	#120	←	←	#135	#120	#135
Main air jet (M.A.J.)	0.5mm	←	←	←	←	←	←
Jet needle (J.N.)	5DH9-3rd	←	←	←	5DH9-4th	5DH9-3rd	5DH9-4th
Needle jet (N.J.)	O-2	←	←	←	←	←	←
Throttle valve (Th.V.)	#120	←	←	←	←	←	←
Pilot jet (P.J.)	#40	←	←	←	←	←	←
By-pass (B.P.)	0.8,0.8 0.8,0.8 mm	←	←	←	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←	←	←	←
Valve seat (V.S.)	1.5 mm	←	←	←	←	←	←
Starter jet (G.S.)	42.5	←	←	←	←	←	←
Pilot screw (P.S.)	PRE-SET (2¼ turns back)	←	←	←	←	←	PRE-SET (2½ turns back)
Pilot air jet (P.A.J.)	1.3 mm	←	←	←	←	←	←
Throttle cable play	0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1200 r/min. 40° B.T.D.C at 4000 r/min.		E-33
		12° B.T.D.C at 1200 r/min. 40° B.T.D.C at 4000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal-Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75V (AC) at 5000 r/min.		
Regulated voltage		13.5—15.5V at 5000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20A		

WATTAGE

Unit: W

ITEM		SPECIFICATION	
		E-03, 28, 33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		47 (1.9)	———
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	———
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	———
Master cylinder piston diam.	Front	12.657 – 12.684 (0.4983 – 0.4994)	———
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	———
Brake caliper cylinder bore	Front	27.000 – 27.076 (1.0630 – 1.0660)	———
		33.960 – 34.036 (1.3370 – 1.3400)	———
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	———
Brake caliper piston diam.	Front	26.920 – 26.970 (1.0598 – 1.0618)	———
		33.884 – 33.934 (1.3340 – 1.3360)	———
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	110/70-17 54H	———
	Rear	130/70-17 62H	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	254 (10.0)	
Front fork oil level	99 (3.9)	———	
Rear shock absor ber spring adjuster	4th/7	———	
Rear wheel travel	115 (4.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

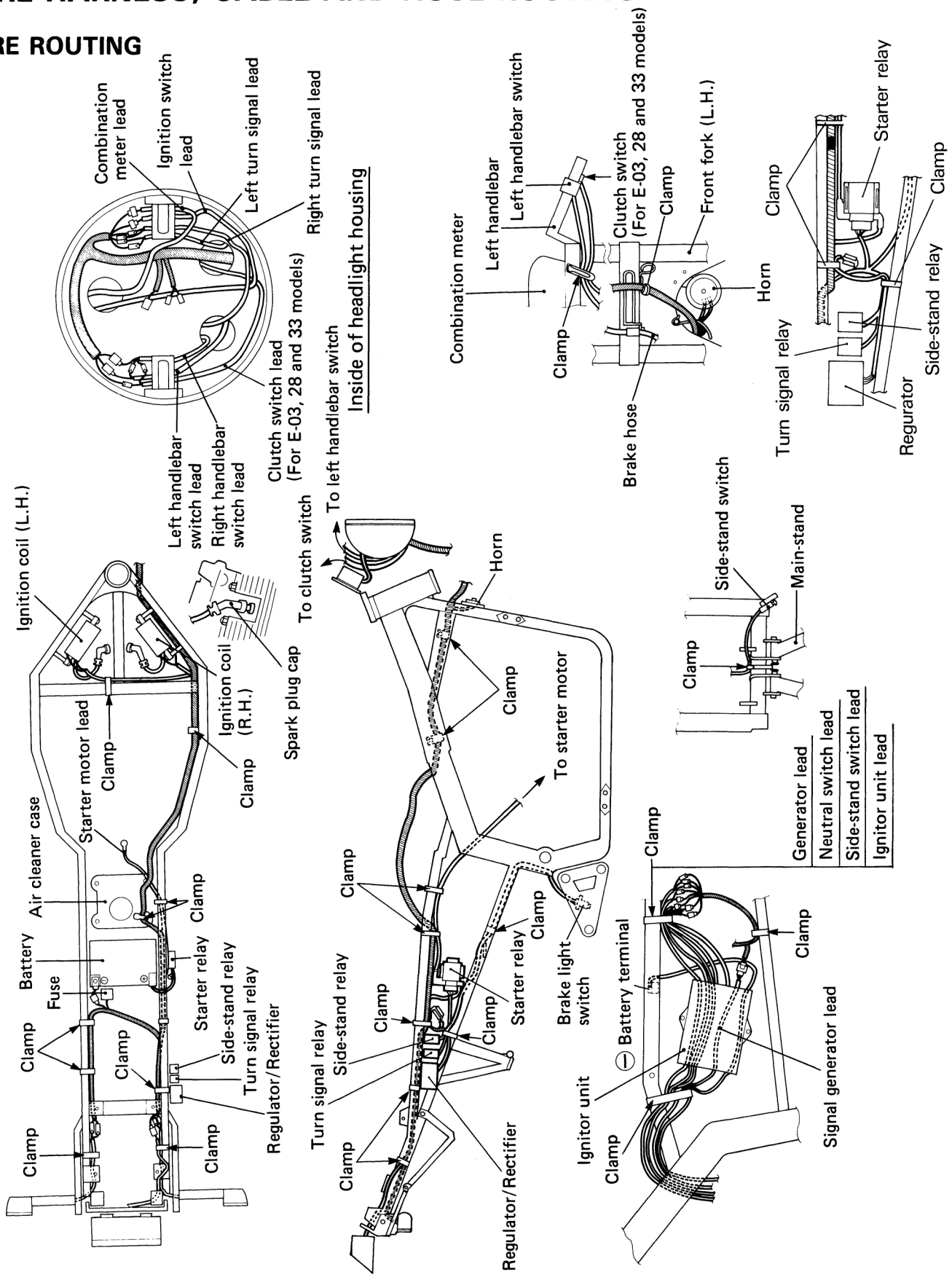
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and coorosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Immp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (3.7/3.1 US/Imp qt)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capcity	Change	2600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil # 10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		
Brake fluid type	DOT 4		

WIRE HARNESS, CABLE AND HOSE ROUTING

WIRE ROUTING



GS500EN ('92-MODEL)

CONTENTS

SPECIFICATIONS 10- 1
SERVICE DATA 10- 2
FRONT FORK 10-10
WIRING DIAGRAM 10-11
SPEEDOMETER CABLE ROUTING 10-12
AIR SUPPLY HOSE ROUTING
(For Austria and Switzerland models) 10-13

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 075 mm (81.7 in) 2 095 mm (82.5 in) . . . . . E17 2 105 mm (82.9 in) . . . . . E25 2 180 mm (85.8 in) E15, 16, 22
Overall width	755 mm (29.7 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	169 kg (373 lbs)
ENGINE	
Type	Four-stroke, air-cooled, DOHC, TDCC
Valve clearance (IN & EX)	0.03 – 0.08 mm (0.0012 – 0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	MIKUNI BST33SS, twin
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DAIDO DID. 520V6, 110 links
CHASSIS	
Front suspension	Telescopic, coil spring, oil damped . . . . . E03, 28, 33 Telescopic, coil spring, oil damped, spring pre-load fully adjustable . . . . . Others
Rear suspension	New-link suspension system, oil damped, spring pre-load 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30′
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless
ELECTRICAL	
Ignition type	Fully transistorized
Ignition timing	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min 5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . E33 only
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . . . Except E03, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W
CAPACITIES	
Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal) 15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 only
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.8/2.3 US/Imp qt)
with filter change	2 900 ml (3.0/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) . . . . . E03, 28, 33 377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
	EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—

ITEM	STANDARD		LIMIT
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.2)	———
Clutch release screw	1/4—1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		—
Final reduction ratio		2.437 (39/16)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.777 (32/18)		—
	3rd	1.380 (29/21)		—
	4th	1.125 (27/24)		—
	5th	0.961 (25/26)		—
	Top	0.851 (23/27)		—
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	—
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	—
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		—
Drive chain		Type	D.I.D.: DID520V6	—
		Links	110	—
		20-pitch length	—	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		—

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	# 37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Pilot air jet	(P.A.J.)	1.3 mm	1.35 mm
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION						
		E-01,28	E-02,04, 16,21, 25,34, 53	E-24	E-15,22	E-22 (GS500 E-U)	E-39	E-17
Carburetor type		MIKUNI BST33SS	←	←	←	←	←	←
Bore size		33	←	←	←	←	←	←
I.D. No.		01D20	01D30	01D50	01D70	01D60	01D80	01D9
Idle r/min.		1200± 100 r/min	←	←	←	←	←	←
Float height		14.6± 1.0 mm	←	←	←	←	←	←
Main jet	(M.J.)	#122.5	#120	←	←	#135	#120	#135
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	5DH9-4th	5DH9-3rd	5DH9-4th
Needle jet	(N.J.)	O-2	←	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←	←
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	←	←	←	←	←	PRE-SET (2½ turns back)
Pilot air jet	(P.A.J.)	1.3 mm	←	←	←	←	←	←
Throttle cable play		0.5— 1.0 mm (0.02— 0.04 in)	←	←	←	←	←	←

ITEM		SPECIFICATION	
		E-18	E-39 (GS500E-U)
Carburetor type		MIKUNI BST33SS	←
Bore size		33	←
I.D. No.		02D1	02D2
Idle r/min.		1300^{+100}_{-50} r/min	1200± 50 r/min
Float height		14.6± 1.0 mm	←
Main jet	(M.J.)	Right: #115, Left: #120	Right: #115, Left: #125
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH9-3rd	←
Needle jet	(N.J.)	O-2	←
Throttle valve	(Th.V.)	#125	←
Pilot jet	(P.J.)	#40	←

ITEM		SPECIFICATION	
		E-18	E-39 (GS500E-U)
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (1¾ turns back)
Pilot air jet	(P.A.J.)	1.4 mm	←
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←

ITEM	SPECIFICATION	
	E-03,28,33	The others
Turn signal indicator light	3.4	←
High beam indicator light	1.7	←
Neutral indicator light	3.4	←
Oil pressure indicator light	3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	47 (1.9)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	—
	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Front	27.000—27.076 (1.0630—1.0660)	—
		33.960—34.036 (1.3370—1.3400)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	26.920—26.970 (1.0598—1.0618)	—
		33.884—33.934 (1.3340—1.3360)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th/7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

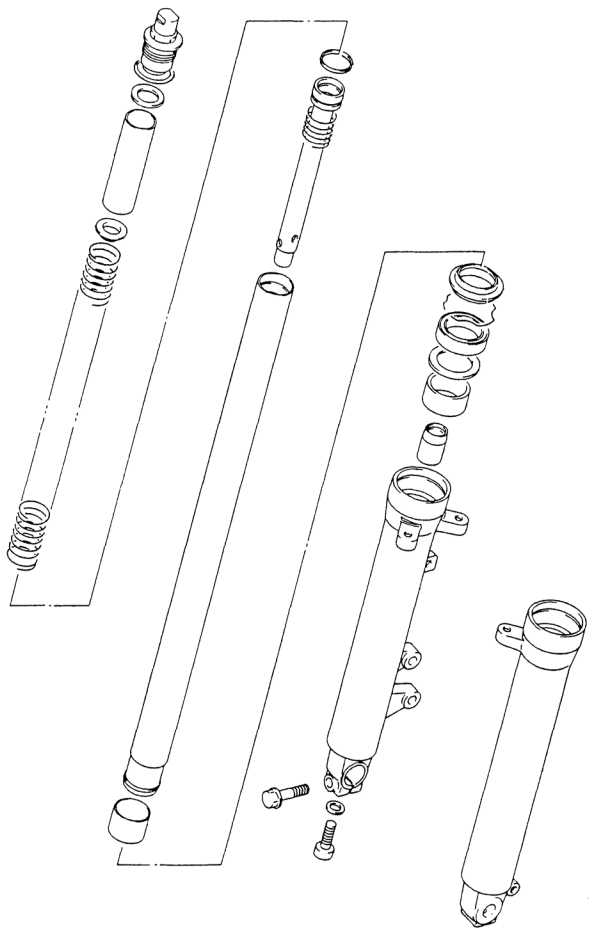
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	

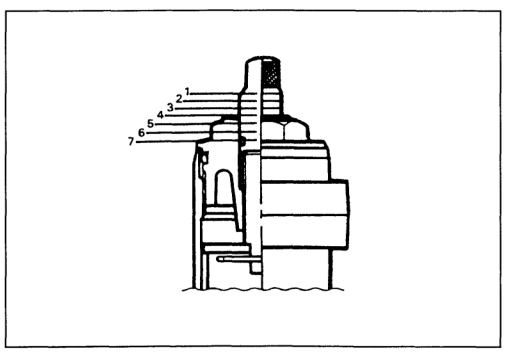
ITEM	SPECIFICATION	NOTE
Front fork oil type	Fork oil #10	
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)	E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)	For the others
Brake fluid type	DOT 4	

FRONT FORK (EXCEPT FOR U.S.A. and CANADA)



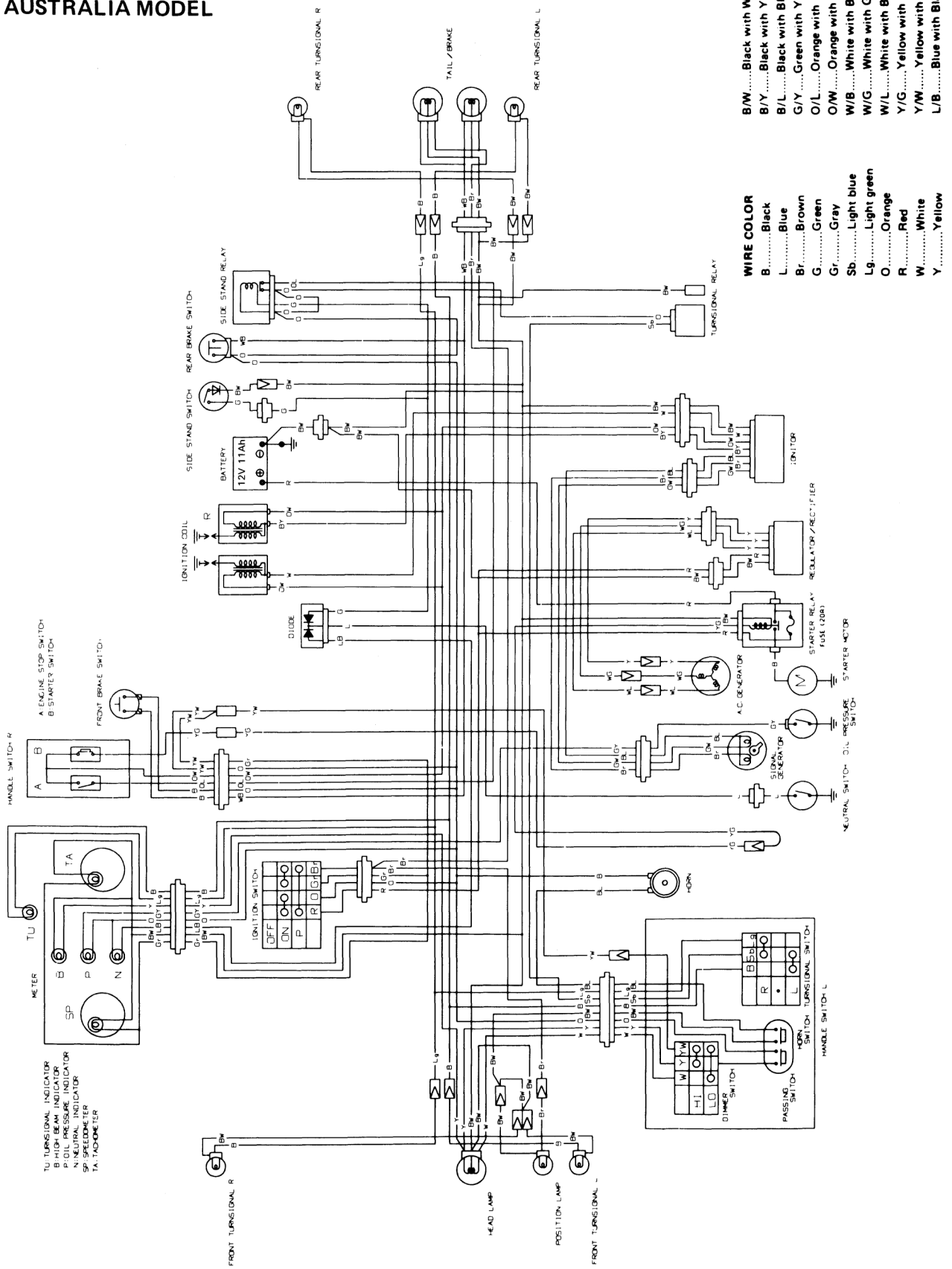
SPRING PRE-LOAD ADJUSTMENT

There are seven grooved lines on the side of the spring adjuster. Position 1 provides the maximum spring pre-load and position 7 provides the minimum spring pre-load.
(STD position is 4.)

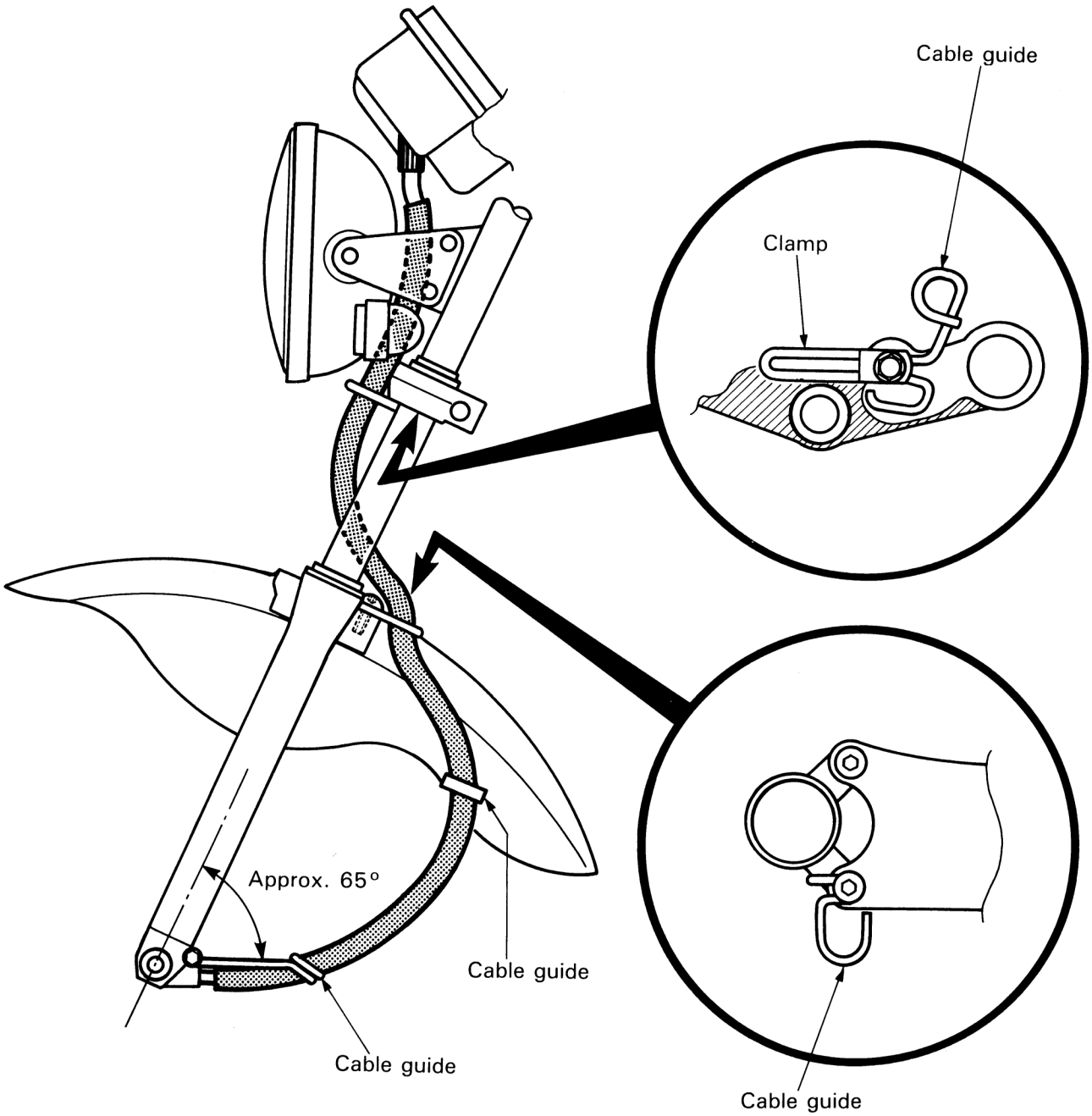


WIRING DIAGRAM

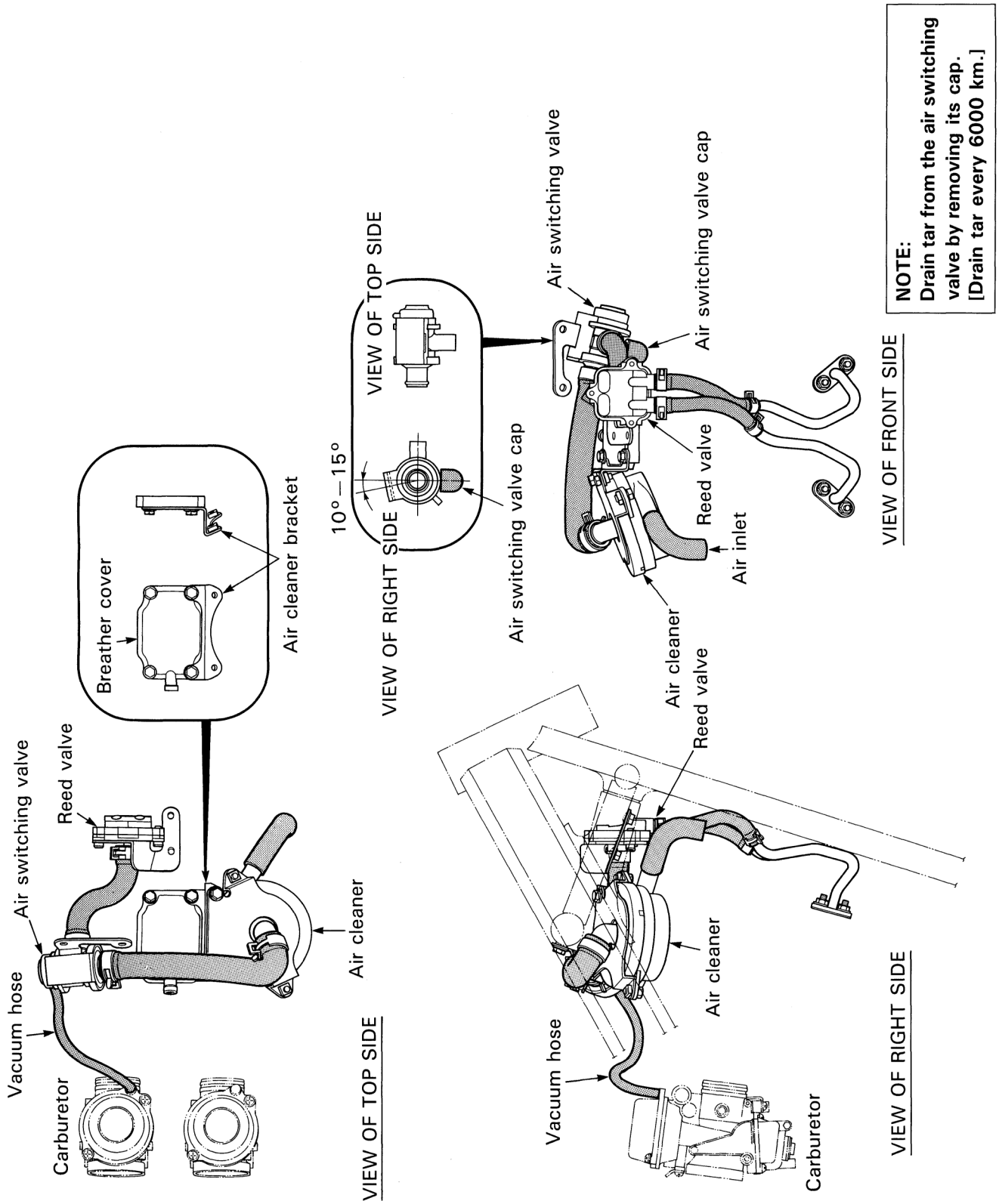
FOR AUSTRALIA MODEL



SPEEDOMETER CABLE ROUTING



AIR SUPPLY HOSE ROUTING (For Austria and Switzerland models)



GS500EP ('93-MODEL)

CONTENTS

SPECIFICATIONS 11- 1
SERVICE DATA 11- 2
WIRING DIAGRAM 11-11

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 075 mm (81.7 in) 2 095 mm (82.5 in) . . . . . E17 2 105 mm (82.9 in) . . . . . E25 2 180 mm (85.8 in) E15, 16, 22
Overall width	755 mm (29.7 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	169 kg (373 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC, TDCC
Valve clearance (IN & EX)	0.03 – 0.08 mm (0.0012 – 0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	MIKUNI BST33SS, twin
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DAIDO DID. 520V6, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped . . . . . E03, 28, 33 Telescopic, coil spring, oil damped, spring pre-load fully adjustable . . . . . Others
Rear suspension	New-link suspension system, oil damped, spring pre-load 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless

ELECTRICAL

Ignition type	Fully transistorized
Ignition timing	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min 5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . E33 only
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . . . Except E03, 24, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank, including reserve	17.0 L (4.5/3.7 US/Imp gal) 15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 only
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.8/2.3 US/Imp qt)
with filter change	2 900 ml (3.0/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) . . . . . E03, 28, 33 377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
	EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—

ITEM	STANDARD		LIMIT
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	4 (0.2)	———
Clutch release screw	1/4—1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		—
Final reduction ratio		2.437 (39/16)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.777 (32/18)		—
	3rd	1.380 (29/21)		—
	4th	1.125 (27/24)		—
	5th	0.961 (25/26)		—
	Top	0.851 (23/27)		—
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	—
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	—
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		—
Drive chain		Type	D.I.D.: DID520V6	—
		Links	110	—
		20-pitch length	—	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		—

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	#122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	#37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Pilot air jet	(P.A.J.)	1.3 mm	1.35 mm
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

CARBURETOR

ITEM		SPECIFICATION					
		E-01,28	E-02,04, 21,25, 34,53	E-24	E-22	E-22 (GS500 E-U)	E-17
Carburetor type		MIKUNI BST33SS	←	←	←	←	←
Bore size		33	←	←	←	←	←
I.D. No.		01D20	01D30	01D50	01D70	01D60	01D9
Idle r/min.		1200 ± 100 r/min.	←	←	←	←	←
Float height		14.6 ± 1.0 mm	←	←	←	←	←
Main jet	(M.J.)	#122.5	#120	←	←	#135	←
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	5DH9-4th	←
Needle jet	(N.J.)	O-2	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	←	←	←	←	←
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	←	←	←	←	PRE-SET (2½ turns back)
Pilot air jet	(P.A.J.)	1.3 mm	←	←	←	←	←
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←	←	←	←	←

ITEM		SPECIFICATION	
		E-18	E-39 (GS500E-U)
Carburetor type		MIKUNI BST33SS	←
Bore size		33	←
I.D. No.		02D1	02D2
Idle r/min.		1300^{+100}_{-50} r/min.	1200 ± 50 r/min.
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	Right: #115, Left: #120	Right: #115, Left: #125
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH9-3rd	←
Needle jet	(N.J.)	O-2	←
Throttle valve	(Th.V.)	#125	←
Pilot jet	(P.J.)	#40	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (1¾ turns back)
Pilot air jet	(P.A.J.)	1.4 mm	←
Throttle cable play		0.5—1.0 mm (0.02—0.04 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	47 (1.9)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	—
	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Front	27.000—27.076 (1.0630—1.0660)	—
		33.960—34.036 (1.3370—1.3400)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	26.920—26.970 (1.0598—1.0618)	—
		33.884—33.934 (1.3340—1.3360)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others

ITEM	STANDARD	LIMIT	NOTE
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th/7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

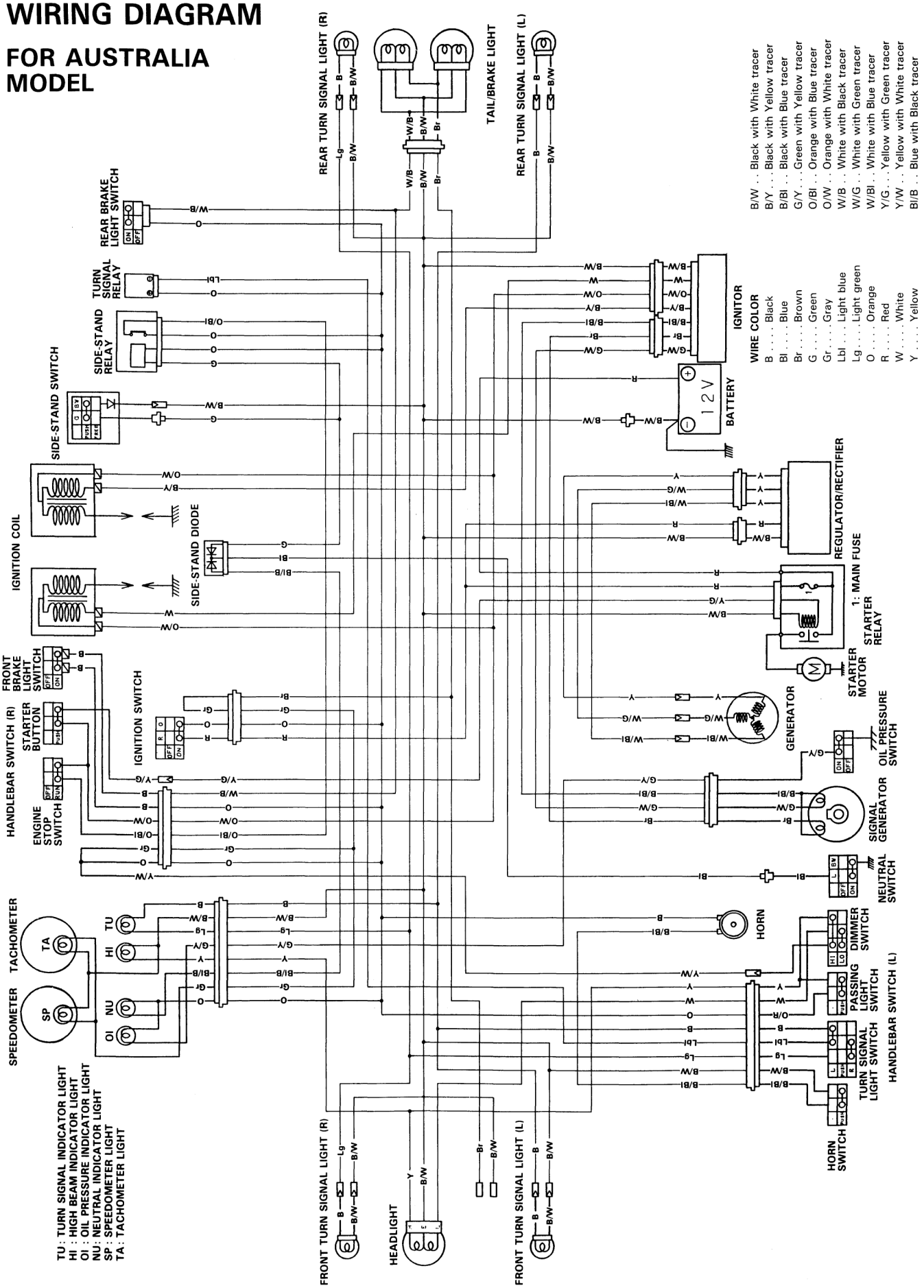
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

WIRING DIAGRAM

FOR AUSTRALIA MODEL


REAR TURN SIGNAL LIGHT (R)
TAIL/BRAKE LIGHT
REAR TURN SIGNAL LIGHT (L)
REAR BRAKE LIGHT SWITCH
TURN SIGNAL RELAY
SIDE-STAND RELAY
SIDE-STAND SWITCH
IGNITOR
WIRE COLOR
B . . . . Black
Bl . . . . Blue
Br . . . . Brown
G . . . . Green
Gr . . . . Gray
Lbl . . . Light blue
Lg . . . Light green
O . . . . Orange
R . . . . Red
W . . . . White
Y . . . . Yellow
B/W . . Black with White tracer
B/Y . . . Black with Yellow tracer
B/Bl . . Black with Blue tracer
G/Y . . . Green with Yellow tracer
O/Bl . . Orange with Blue tracer
O/W . . Orange with White tracer
W/B . . White with Black tracer
W/G . . White with Green tracer
W/Bl . . White with Blue tracer
Y/G . . . Yellow with Green tracer
Y/W . . . Yellow with White tracer
Bl/B . . Blue with Black tracer
BATTERY
12V
IGNITION COIL
SIDE-STAND DIODE
REGULATOR/RECTIFIER
1: MAIN FUSE
STARTER RELAY
STARTER MOTOR
GENERATOR
OIL PRESSURE SWITCH
FRONT BRAKE LIGHT SWITCH
STARTER BUTTON
IGNITION SWITCH
HANDLEBAR SWITCH (R)
ENGINE STOP SWITCH
SIGNAL GENERATOR
NEUTRAL SWITCH
SPEEDOMETER
TACHOMETER
HORN
DIMMER SWITCH
PASSING LIGHT SWITCH
TURN SIGNAL LIGHT SWITCH
HANDLEBAR SWITCH (L)
HORN SWITCH
FRONT TURN SIGNAL LIGHT (R)
HEADLIGHT
FRONT TURN SIGNAL LIGHT (L)
TU : TURN SIGNAL INDICATOR LIGHT
HI : HIGH BEAM INDICATOR LIGHT
OI : OIL PRESSURE INDICATOR LIGHT
NU : NEUTRAL INDICATOR LIGHT
SP : SPEEDOMETER LIGHT
TA : TACHOMETER LIGHT

GS500ER ('94-MODEL)

CONTENTS

SPECIFICATIONS 12- 1
SERVICE DATA 12- 2

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 095 mm (82.5 in) . . . . . E17 2 105 mm (82.9 in) . . . . . E25 2 180 mm (85.8 in) . . . . . E22 2 075 mm (81.7 in) . . . . . Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs) . . . . . E33 169 kg (372 lbs). . . . . Others

ENGINE

Type	Four-stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03—0.08 mm (0.0012—0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BST33, twin
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DID. 520V_6, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped . . . . E03, 28, 33 Telescopic coil spring, oil damped, spring preload fully adjustable . . . . Others
Rear suspension	Link type, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H
Rear tire size	130/70-17 62H

ELECTRICAL

Ignition type	Transistorized
Ignition timing	5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . . E33 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C at 4000 r/min . . . . Others
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . .Except E03, 24, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 17.0 L (4.5/3.7 US/Imp gal) . . . . . Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp.qt)
with filter change	2 900 ml (3.1/2.6 US/Imp. qt)
overhaul	3 200 ml (3.4/2.8 US/Imp.qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) . . . . . E03,28,33 377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM			STANDARD	LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
		EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
	For the others	IN.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
		EX.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
Camshaft journal oil clearance		IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)

ITEM	STANDARD		LIMIT
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	

ITEM	STANDARD	LIMIT
Piston pin bore	18.002—18.008 (0.7087—0.7090)	18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)	17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	10—15 (0.4—0.6)	———
Clutch release screw	1/4—1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		2.714 (76/28)	———
Final reduction ratio		2.437 (39/16)	———
Gear ratios	Low	2.461 (32/13)	———
	2nd	1.777 (32/18)	———
	3rd	1.380 (29/21)	———
	4th	1.125 (27/24)	———
	5th	0.961 (25/26)	———
	Top	0.851 (23/27)	———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)	0.5 (0.020)
Shift fork groove width	No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness	No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$	———
Drive chain	Type	D.I.D.: DID520V6	———
	Links	110	———
	20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)	———

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	#122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	#37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Pilot air jet	(P.A.J.)	1.3 mm	1.35 mm
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM		SPECIFICATION					
		E-28	E-02,04, 21,25, 34,37,53	E-24	E-22	E-22,34 (GS500 E-U)	E-17
Carburetor type		MIKUNI BST33SS	←	←	←	←	←
Bore size		33	←	←	←	←	←
I.D. No.		01D20	02D5	01D50	02D6	02D3	01D9
Idle r/min.		1200 ± 100 r/min.	←	←	←	←	←
Float height		14.6 ± 1.0 mm	←	←	←	←	←
Main jet	(M.J.)	#122.5	L: #125 R: #122.5	#120	L: #125 R: #122.5	#130	#135
Main air jet	(M.A.J.)	0.5 mm	←	←	←	←	←
Jet needle	(J.N.)	5DH9-3rd	←	←	←	←	5DH9-4th
Needle jet	(N.J.)	O-2	←	←	←	←	←
Throttle valve	(Th.V.)	#120	←	←	←	←	←
Pilot jet	(P.J.)	#40	←	←	←	←	←
By-pass	(B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←	←	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm	0.8 mm	0.9 mm	←	0.8 mm
Valve seat	(V.S.)	1.5 mm	←	←	←	←	←
Starter jet	(G.S.)	#42.5	←	←	←	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	PRE-SET (1⅞ turns back)	PRE-SET (2¼ turns back)	PRE-SET (1⅝ turns back)	PRE-SET (1⅞ turns back)	PRE-SET (2½ turns back)
Pilot air jet	(P.A.J.)	1.3 mm	1.2 mm	1.3 mm	1.2 mm	1.25 mm	1.3 mm
Throttle cable play		3—6 mm (0.1—0.2 in)	←	←	←	←	←

ITEM		SPECIFICATION	
		E-18	E-39 (GS500E-U)
Carburetor type		MIKUNI BST33SS	←
Bore size		33	←
I.D. No.		02D1	02D2
Idle r/min.		1300^{+100}_{-50} r/min.	1200 ± 50 r/min.
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	Right: #115, Left: #120	Right: #115, Left: #125
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH9-3rd	←
Needle jet	(N.J.)	O-2	←
Throttle valve	(Th.V.)	#125	←
Pilot jet	(P.J.)	#40	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (1¾ turns back)
Pilot air jet	(P.A.J.)	1.4 mm	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	47 (1.9)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4994)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	27.000–27.076 (1.0630–1.0660)	—
		33.960–34.036 (1.3370–1.3400)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.920–26.970 (1.0598–1.0618)	—
		33.884–33.934 (1.3340–1.3360)	—
	Rear	38.098–38.148 (1.4999–1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others

ITEM	STANDARD	LIMIT	NOTE
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th/7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

GS500ES ('95-MODEL)

CONTENTS

SPECIFICATIONS 13- 1
SERVICE DATA 13- 2
CABLE ROUTING 13-11

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 105 mm (82.9 in) E25
	2 180 mm (85.8 in) E22
	2 075 mm (81.7 in) . . . . . Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs). E33
	169 kg (372 lbs). . . . . Others

ENGINE

Type	Four-stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03—0.08 mm (0.0012—0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BST33, twin
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DID. 520VS_2, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped E03,28,33
	Telescopic coil spring, oil damped, spring preload fully adjustable . . . Others
Rear suspension	Link type, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/70-17 54H
Rear tire size	130/70-17 62H

ELECTRICAL

Ignition type	Electronic ignition (transistorized)
Ignition timing	5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . E33
	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min. . . . Others
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W. . . . Except E03,28,33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal) E33
	17.0 L (4.5/3.7 US/Imp gal) . . . . . Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp.qt)
with filter change	2 900 ml (3.1/2.6 US/Imp. qt)
overhaul	3 200 ml (3.4/2.8 US/Imp.qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) E03,28,33
	377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	—
	EX.	0.040—0.070 (0.0016—0.0028)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
		EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
	For the others	IN.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
		EX.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)

ITEM	STANDARD		LIMIT
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain 20-pitch length	—		157.8 (6.21)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm²) (142—199 psi)			800 kPa (8 kg/cm²) (114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm²) (28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	

ITEM	STANDARD	LIMIT
Piston pin bore	18.002—18.008 (0.7087—0.7090)	18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)	17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	———
Clutch release screw	1/4—1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		2.714 (76/28)	———
Final reduction ratio		2.437 (39/16)	———
Gear ratios	Low	2.461 (32/13)	———
	2nd	1.777 (32/18)	———
	3rd	1.380 (29/21)	———
	4th	1.125 (27/24)	———
	5th	0.961 (25/26)	———
	Top	0.851 (23/27)	———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)	0.5 (0.020)
Shift fork groove width	No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness	No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$	———
Drive chain	Type	D.I.D.: DID520VS2	———
	Links	110	———
	20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)	———

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	#122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	#37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Pilot air jet	(P.A.J.)	1.3 mm	1.35 mm
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM	SPECIFICATION			
	E-28	E-02,04, 25,34,37	E-22	E-22,34 (GS500E-U)
Carburetor type	MIKUNI BST33SS	←	←	←
Bore size	33	←	←	←
I.D. No.	01D20	02D5	02D6	02D3
Idle r/min.	1200± 100 r/min.	←	←	←
Float height	14.6± 1.0 mm	←	←	←
Main jet (M.J.)	#122.5	L: #125 R: #122.5	←	#130
Main air jet (M.A.J.)	0.5 mm	←	←	←
Jet needle (J.N.)	5DH9-3rd	←	←	←
Needle jet (N.J.)	O-2	←	←	←
Throttle valve (Th.V.)	#120	←	←	←
Pilot jet (P.J.)	#40	←	←	←
By-pass (B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm	←	←
Valve seat (V.S.)	1.5 mm	←	←	←
Starter jet (G.S.)	#42.5	←	←	←
Pilot screw (P.S.)	PRE-SET (2¼ turns back)	PRE-SET (1⅞ turns back)	PRE-SET (1⅝ turns back)	PRE-SET (1⅞ turns back)
Pilot air jet (P.A.J.)	1.3 mm	1.2 mm	←	1.25 mm
Throttle cable play	3—6 mm (0.1—0.2 in)	←	←	←

ITEM		SPECIFICATION	
		E-18	E-39 (GS500E-U)
Carburetor type		MIKUNI BST33SS	←
Bore size		33	←
I.D. No.		02D1	02D2
Idle r/min.		1300^{+100}_{-50} r/min.	1200 ± 50 r/min.
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	Right: #115, Left: #120	Right: #115, Left: #125
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH9-3rd	←
Needle jet	(N.J.)	O-2	←
Throttle valve	(Th.V.)	#125	←
Pilot jet	(P.J.)	#40	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (1¾ turns back)
Pilot air jet	(P.A.J.)	1.4 mm	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4994)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	27.000–27.076 (1.0630–1.0660)	—
		33.960–34.036 (1.3370–1.3400)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.920–26.970 (1.0598–1.0618)	—
		33.884–33.934 (1.3340–1.3360)	—
	Rear	38.098–38.148 (1.4999–1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others

ITEM	STANDARD	LIMIT	NOTE
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th position among 7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

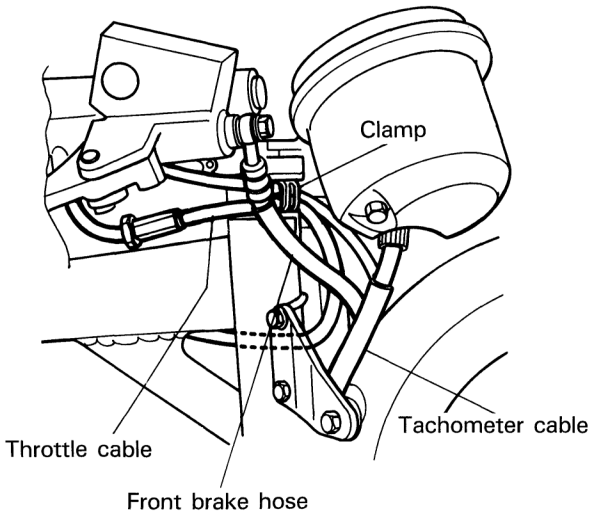
TIRE PRESSURE

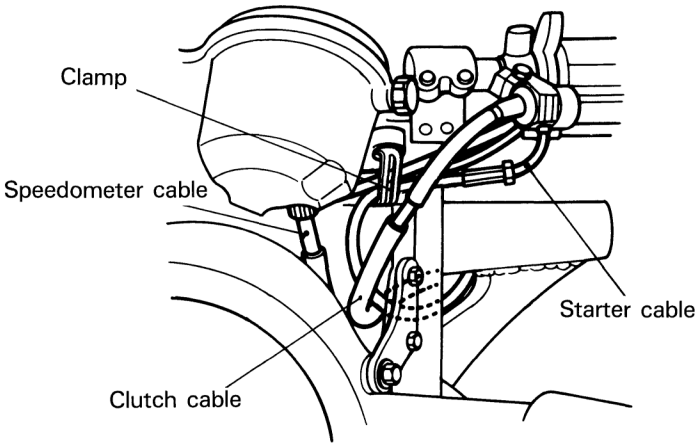
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

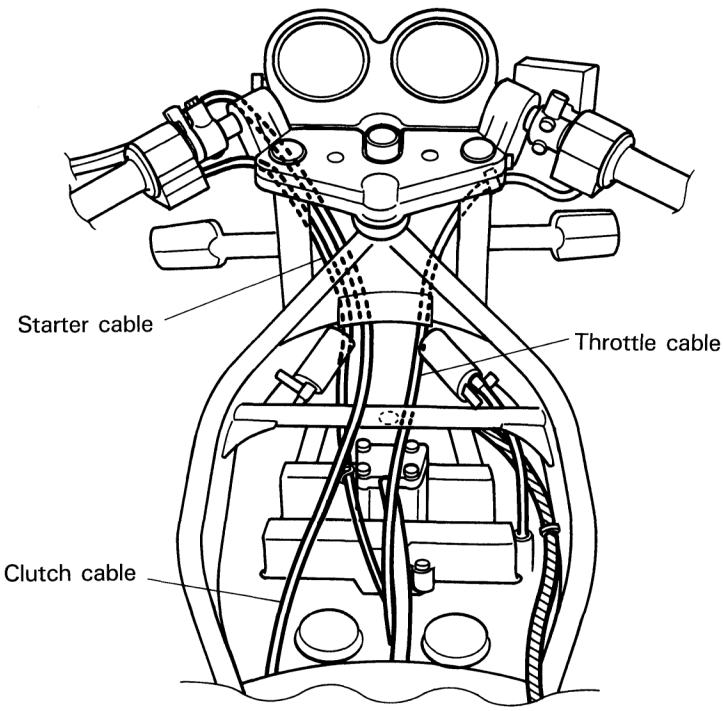
FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

CABLE ROUTING







FOREWORD

This section describes service data, service specifications and servicing procedures which differ from those of the GS500ES ('95-model).

NOTE:
- *Any differences between GS500ES ('95-model) and GS500ET ('96-model) in specifications and service data are cleary indicated with the asterisk marks (*).*
- *Please refer to the section 1 through 13 for details which are not given in this section.*

CONTENTS

SPECIFICATIONS **14- 1**
SERVICE DATA **14- 2**
FRONT BRAKE **14-11**

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 105 mm (82.9 in) E25
	2 180 mm (85.8 in) E22
	2 075 mm (81.7 in) . . . . . Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs). E33
	169 kg (372 lbs). . . . . Others

ENGINE

Type	Four-stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03—0.08 mm (0.0012—0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BST33, twin
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DID. 520VS_2, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped E03,28,33
	Telescopic coil spring, oil damped, spring preload adjustable . . . Others
Rear suspension	Link type, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	64° 30′
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disk brake
Rear brake	Disk brake
Front tire size	110/70-17 54H
Rear tire size	130/70-17 62H

ELECTRICAL

Ignition type	Electronic ignition (transistorized)
Ignition timing	5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . E33
	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . Others
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W . . . .Except E03, 24, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal) E33
	17.0 L (4.5/3.7 US/Imp gal) . . . . . Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp.qt)
with filter change	2 900 ml (3.1/2.6 US/Imp. qt)
overhaul	3 200 ml (3.4/2.8 US/Imp.qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) E03,28,33
	377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	—
	EX.	0.040—0.070 (0.0016—0.0028)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
		EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
	For the others	IN.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
		EX.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)

ITEM	STANDARD		LIMIT
Camshaft journal oil clearance	IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.	IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959—21.980 (0.8645—0.8654)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")	18th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050—0.060 (0.0020—0.0024)			0.120 (0.0047)
Cylinder bore	74.000—74.015 (2.9134—2.9140)			74.080 (2.9165)
Piston diam.	73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.21—1.23 (0.047—0.048)	
	2nd		1.21—1.23 (0.047—0.048)	
	Oil		2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st		1.17—1.19 (0.046—0.047)	
	2nd		1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)			18.030 (0.7098)

ITEM	STANDARD	LIMIT
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)	17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	———
Clutch release screw	1/4—1/2 turns back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		—
Final reduction ratio		2.437 (39/16)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.777 (32/18)		—
	3rd	1.380 (29/21)		—
	4th	1.125 (27/24)		—
	5th	0.961 (25/26)		—
	Top	0.851 (23/27)		—
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	—
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	—
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		—
Drive chain		Type	D.I.D.: DID520VS$_2$	—
		Links	110	—
		20-pitch length	—	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		—

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	01D10
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	#122.5	←
Main air jet	(M.A.J.)	0.5 mm	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3	←
Throttle valve	(Th.V.)	#120	←
Pilot jet	(P.J.)	#37.5	←
By-pass	(B.P.)	0.8, 0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	0.9 mm
Valve seat	(V.S.)	1.5 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM	SPECIFICATION			
	E-28	E-02,04, 25,34	E-22	E-22 (GS500E-U)
Carburetor type	MIKUNI BST33SS	←	←	←
Bore size	33	←	←	←
I.D. No.	01D20	*02D8	*02DA	*02DB
Idle r/min.	1200± 100 r/min.	←	←	←
Float height	14.6± 1.0 mm	←	←	←
Main jet (M.J.)	#122.5	*#115	*←	*#117.5
Main air jet (M.A.J.)	0.5 mm	←	←	←
Jet needle (J.N.)	5DH9-3rd	←	←	*5DH9-2nd
Needle jet (N.J.)	O-2	←	←	←
Throttle valve (Th.V.)	#120	←	←	←
Pilot jet (P.J.)	#40	←	←	←
By-pass (B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	0.9 mm	←	←
Valve seat (V.S.)	1.5 mm	←	←	←
Starter jet (G.S.)	#42.5	←	←	←
Pilot screw (P.S.)	PRE-SET (2¼ turns back)	*PRE-SET (2 turns back)	*←	*←
Pilot air jet (P.A.J.)	1.3 mm	*←	*←	*←
Throttle cable play	3—6 mm (0.1—0.2 in)	←	←	←

Asterisk mark (*) indicates the new "T"-model specifications.

CARBURETOR

ITEM	SPECIFICATION			
	E-24	E-37	E-18	E-39 (GS500E-U)
Carburetor type	MIKUNI BST33SS	←	←	←
Bore size	33	←	←	←
I.D. No.	*01D6	02D5	02D1	02D2
Idle r/min.	1200 ± 100 r/min.	←	1300^{+100}_{-50} r/min.	1200 ± 50 r/min.
Float height	14.6 ± 1.0 mm	←	←	←
Main jet (M.J.)	*L: #125 *R: #122.5	←	L: #120 R: #115	L: #125 R: #115
Main air jet (M.A.J.)	0.5 mm	←	←	←
Jet needle (J.N.)	5DH9-3rd	←	←	←
Needle jet (N.J.)	O-2	←	←	←
Throttle valve (Th.V.)	#120	←	#125	←
Pilot jet (P.J.)	#40	←	←	←
By-pass (B.P.)	0.8, 0.8 0.8, 0.8 mm	←	←	←
Pilot outlet (P.O.)	*0.9 mm	←	0.8 mm	←
Valve seat (V.S.)	1.5 mm	←	←	←
Starter jet (G.S.)	#42.5	←	←	←
Pilot screw (P.S.)	*PRE-SET (1 5/8 turns back)	PRE-SET (1 7/8 turns back)	PRE-SET (1 5/8 turns back)	PRE-SET (1 3/4 turns back)
Pilot air jet (P.A.J.)	*1.2 mm	←	1.4 mm	←
Throttle cable play	3—6 mm (0.1—0.2 in)	←	←	←

Asterisk mark (*) indicates the new "T"-model specifications.

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250—420 Ω		
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	—
	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Front	*30.230—30.306 (1.1902—1.1931)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	*30.150—30.200 (1.1870—1.1890)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others

Asterisk mark (*) indicates the new "T"-model specifications.

ITEM	STANDARD	LIMIT	NOTE
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th position among 7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

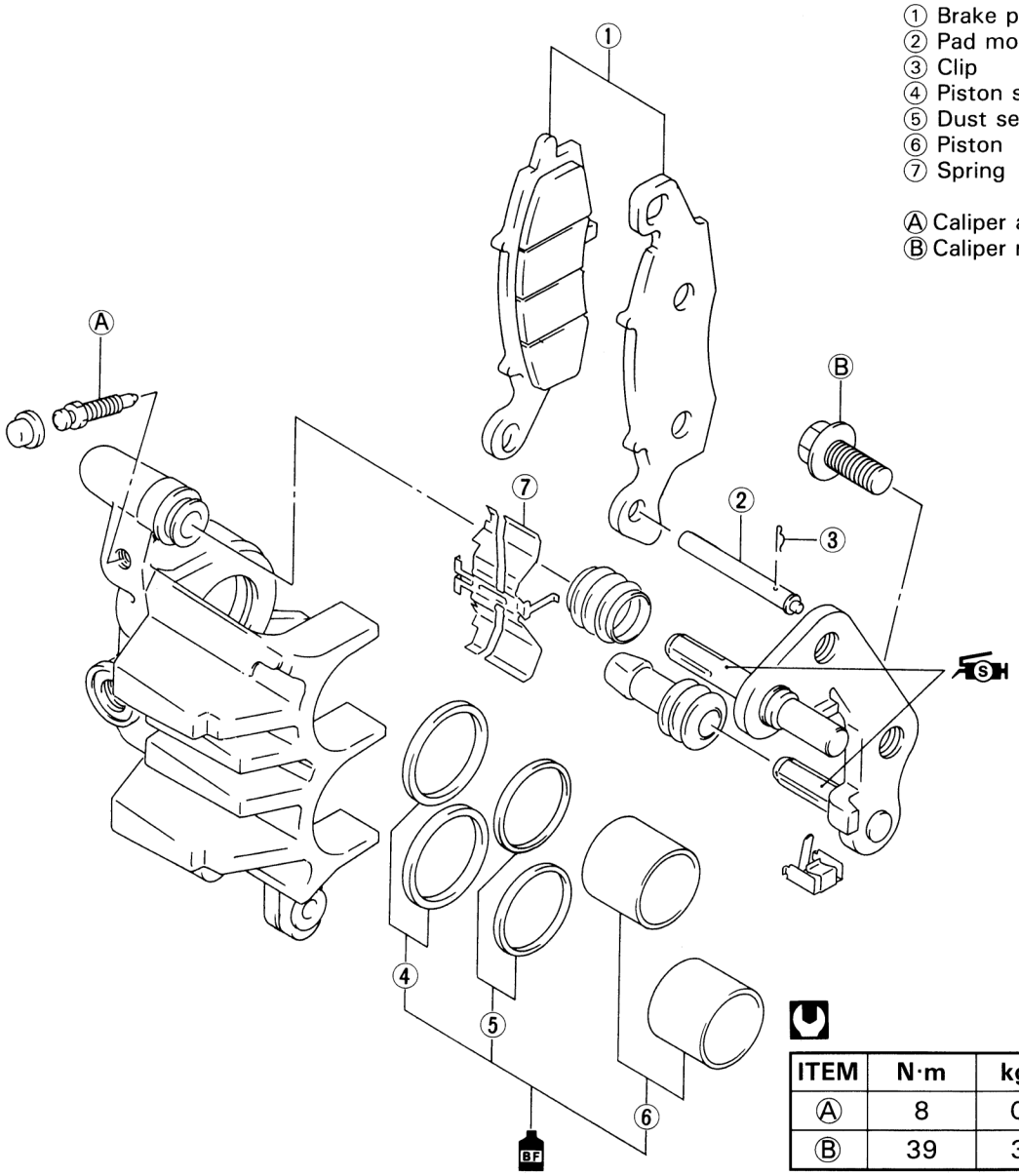
TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SE, SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil # 10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

FRONT BRAKE



ITEM	N·m	kg-m	lb-ft
Ⓐ	8	0.8	6.0
Ⓑ	39	3.9	28.0

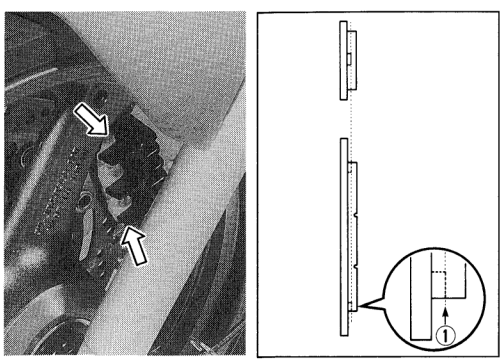
: Tightening torque

BF : Apply brake fluid.

SH : Apply SUZUKI SILICONE GREASE.

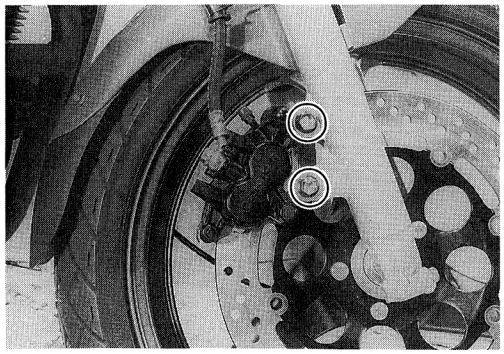
BRAKE PAD INSPECTION

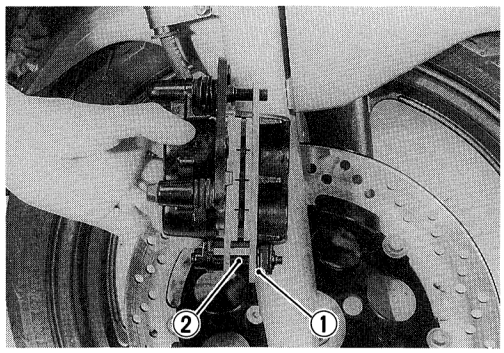
The extent of brake pad wear can be checked by observing the limit line ① on the pad. When the wear exceeds the limit line, replace the pads with new ones.



BRAKE PAD REPLACEMENT

- Disconnect the brake caliper by removing the caliper mounting bolt.
- Remove the brake pads by removing the clip ①, pad mounting pin ②.





⚠ CAUTION

- **Do not operate the brake lever while dismounting the pads.**
- **Replace the brake pad as a set, otherwise braking performance will be adversely affected.**

- Remount the new pads.

NOTE:
After replacing the brake pads, pump with the brake lever few times to operate the brake correctly and then check the brake fluid level.

CALIPER REMOVAL AND DISASSEMBLY

- Remove and disassemble the brake caliper in the same manner of the '95-model.

CALIPER INTERCHANGEABILITY

- When replacing the brake caliper assembly with a early or late type, should replace the brake disc with a same type one.

PART NAME	EARLY	LATE
	PART NO.	PART NO.
Brake caliper assembly	59100-01D01	59100-33D00
Brake disc	59210-01D30	59210-01D40

GS500EV ('97-MODEL)

CONTENTS

SPECIFICATIONS 15- 1
SERVICE DATA 15- 2
WIRING DIAGRAM 15-11

NOTE:
Asterisk mark (*) indicates the New V-model specifications.

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 105 mm (82.9 in) E25
	2 180 mm (85.8 in) E22, E18, E39
	2 075 mm (81.7 in) . . . . . Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs). E33
	169 kg (372 lbs). . . . . Others

ENGINE

Type	Four-stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03—0.08 mm (0.0012—0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Piston displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BST33, twin
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	DID. 520VS_2, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped E03,28,33
	Telescopic coil spring, oil damped, spring preload adjustable . . . Others
Rear suspension	Link type, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	25° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disk brake
Rear brake	Disk brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless

ELECTRICAL

Ignition type	Electronic ignition (transistorized)
Ignition timing	5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . E33
	12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . Others
Spark plug	NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W. . . .Except E03, 24, 28, 33
Turn signal light	12V 21W
Tail/brake light	12V 5/21W (x 2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal) E33
	17.0 L (4.5/3.7 US/Imp gal) . . . . . Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp.qt)
with filter change	2 900 ml (3.1/2.6 US/Imp. qt)
overhaul	3 200 ml (3.4/2.8 US/Imp.qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) E03,28,33
	377 ml (12.7/13.3 US/Imp oz) . . . . . Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	—
	EX.	0.040—0.070 (0.0016—0.0028)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
		EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
	For the others	IN.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
		EX.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
Camshaft journal oil clearance		IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.		IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.		IN. & EX.	21.959—21.980 (0.8645—0.8654)	—
Camshaft runout		IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		18th pin		—
Cylinder head distortion		—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			STANDARD	LIMIT
Compression pressure			1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)	800 kPa (8 kg/cm², 114 psi)
Compression pressure difference			—	200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance			0.050—0.060 (0.0020—0.0024)	0.120 (0.0047)
Cylinder bore			74.000—74.015 (2.9134—2.9140)	74.080 (2.9165)
Piston diam.			73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.	73.880 (2.9087)
Cylinder distortion			—	0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.21—1.23 (0.047—0.048)	
	2nd	1.21—1.23 (0.047—0.048)	
	Oil	2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st	1.17—1.19 (0.046—0.047)	
	2nd	1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)		18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)		17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	—
Clutch release screw	1/4—1/2 turn back	—
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		—
Final reduction ratio		2.437 (39/16)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.777 (32/18)		—
	3rd	1.380 (29/21)		—
	4th	1.125 (27/24)		—
	5th	0.961 (25/26)		—
	Top	0.851 (23/27)		—
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	—
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	—
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		—
Drive chain		Type	D.I.D.: DID520VS2	—
		Links	110	—
		20-pitch length	—	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		—

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No		01D00	*01DA
Idle r/min.		1 200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 122.5	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3M	←
Throttle valve	(Th.V.)	#120	*#125
Pilot jet	(P.J.)	# 37.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM		SPECIFICATION			
		E-28	E-02,04, 25,34	E-22	E-04,22 (GS500E-U)
Carburetor type		MIKUNI BST33SS	←	←	←
Bore size		33 mm	←	←	←
I.D. No.		*01D00	02D8	02DA	02DB
Idle r/min.		1200± 100 r/min.	←	←	←
Float height		14.6± 1.0 mm	←	←	←
Main jet	(M.J.)	*# 122.5	#115	←	#117.5
Jet needle	(J.N.)	*5DH8	5DH9-3rd	←	5DH9-2nd
Needle jet	(N.J.)	*O-3M	O-2	←	←
Throttle valve	(Th.V.)	#120	←	←	←
Pilot jet	(P.J.)	*# 37.5	#40	←	←
Pilot screw	(P.S.)	PRE-SET (2¼ turns back)	PRE-SET (2 turns back)	←	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←	←	←

CARBURETOR

ITEM	SPECIFICATION			
	E-24	P-37	E-18	E-39 (GS500E-U)
Carburetor type	MIKUNI BST33SS	←	←	←
Bore size	33	←	←	←
I.D. No.	01D6	02D5	02D1	02D2

ITEM	SPECIFICATION			
	E-24	E-37, P-37	E-18	E-39 (GS500E-U)
Idle r/min.	1200 ± 100 r/min.	←	1300^{+100}_{-50} r/min.	1200 ± 50 r/min.
Float height	14.6 ± 1.0 mm	←	←	←
Main jet (M.J.)	L: # 125 R: # 122.5	←	L: # 120 R: # 115	L: # 125 R: # 115
Jet needle (J.N.)	5DH9-3rd	←	←	←
Needle jet (N.J.)	O-2	←	←	←
Throttle valve (Th.V.)	# 120	←	# 125	←
Pilot jet (P.J.)	# 40	←	←	←
Pilot screw (P.S.)	PRE-SET (1 5/8 turns back)	PRE-SET (1 7/8 turns back)	PRE-SET (1 5/8 turns back)	PRE-SET (1 3/4 turns back)
Throttle cable play	3 — 6 mm (0.1 — 0.2 in)	←	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	N.D.: X24EPR-U9 NGK.: DPR8EA-9	
		Gap	0.8 — 0.9 (0.031 — 0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		250 — 420 Ω		
Ignition coil resistance		Primary	3 — 6 Ω	Terminal — Terminal
		Secondary	18 — 30 kΩ	Plug cap — Terminal
Generator Max. output		Approx. 200W at 5 000 r/min.		
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5 — 15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3 — 5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Tail/Brake light		5/21	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700–12.743 (0.5000–0.5017)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	12.657–12.684 (0.4983–0.4994)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	30.230–30.306 (1.1902–1.1931)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	30.150–30.200 (1.1870–1.1890)	—
	Rear	38.098–38.148 (1.4999–1.5019)	—

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	J17 × MT3.00	—
	Rear	J17 × MT3.50	—
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	254 (10.0)	E-03,28,33
	—	303 (11.9)	For the others
Front fork oil level	99 (3.9)	—	E-03,28,33
	105 (4.1)	—	For the others
Rear shock absorber spring adjuster	4th position among 7	—	
Rear wheel travel	115 (4.5)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

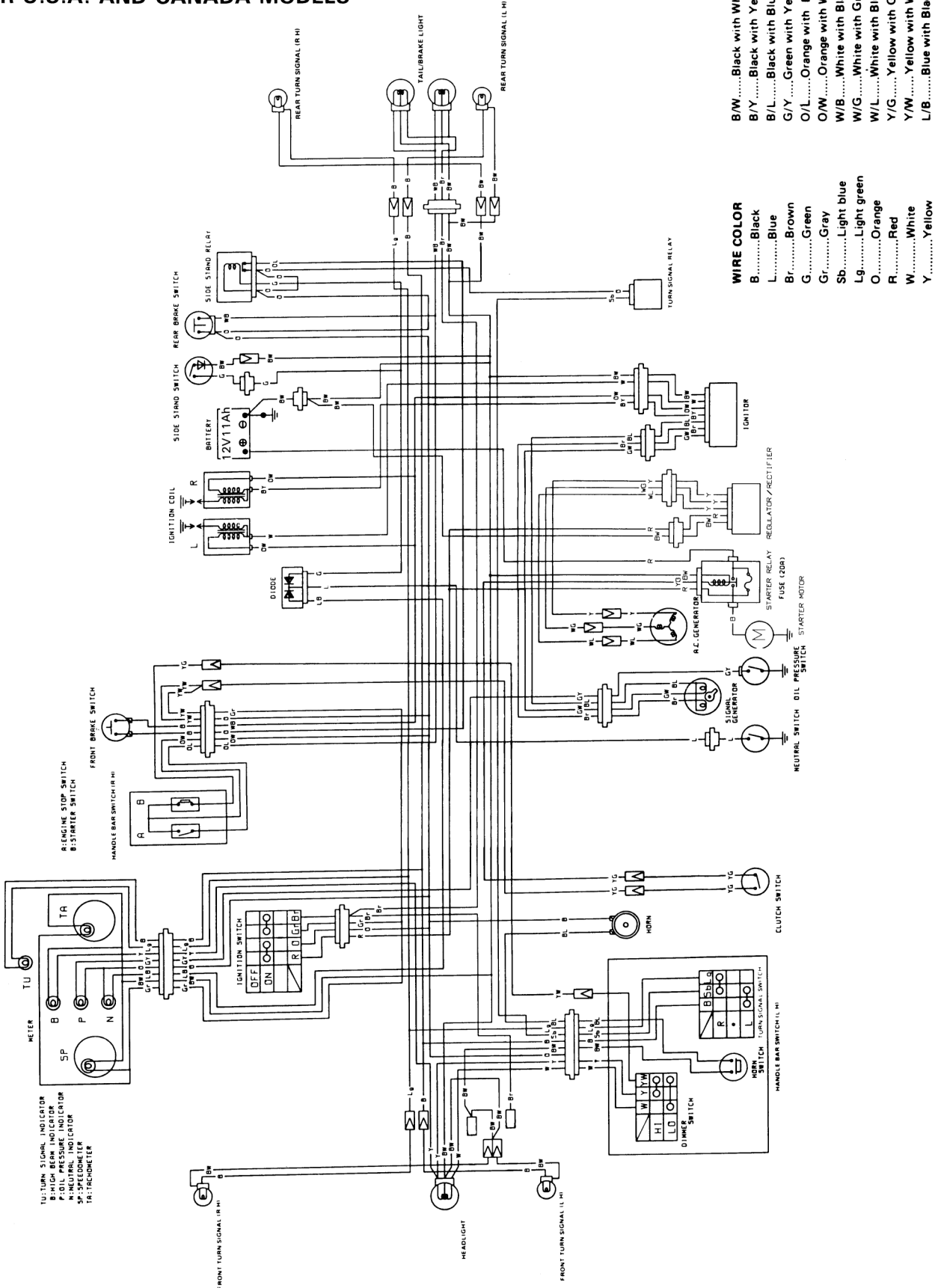
COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil # 10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

WIRING DIAGRAM

FOR U.S.A. AND CANADA MODELS

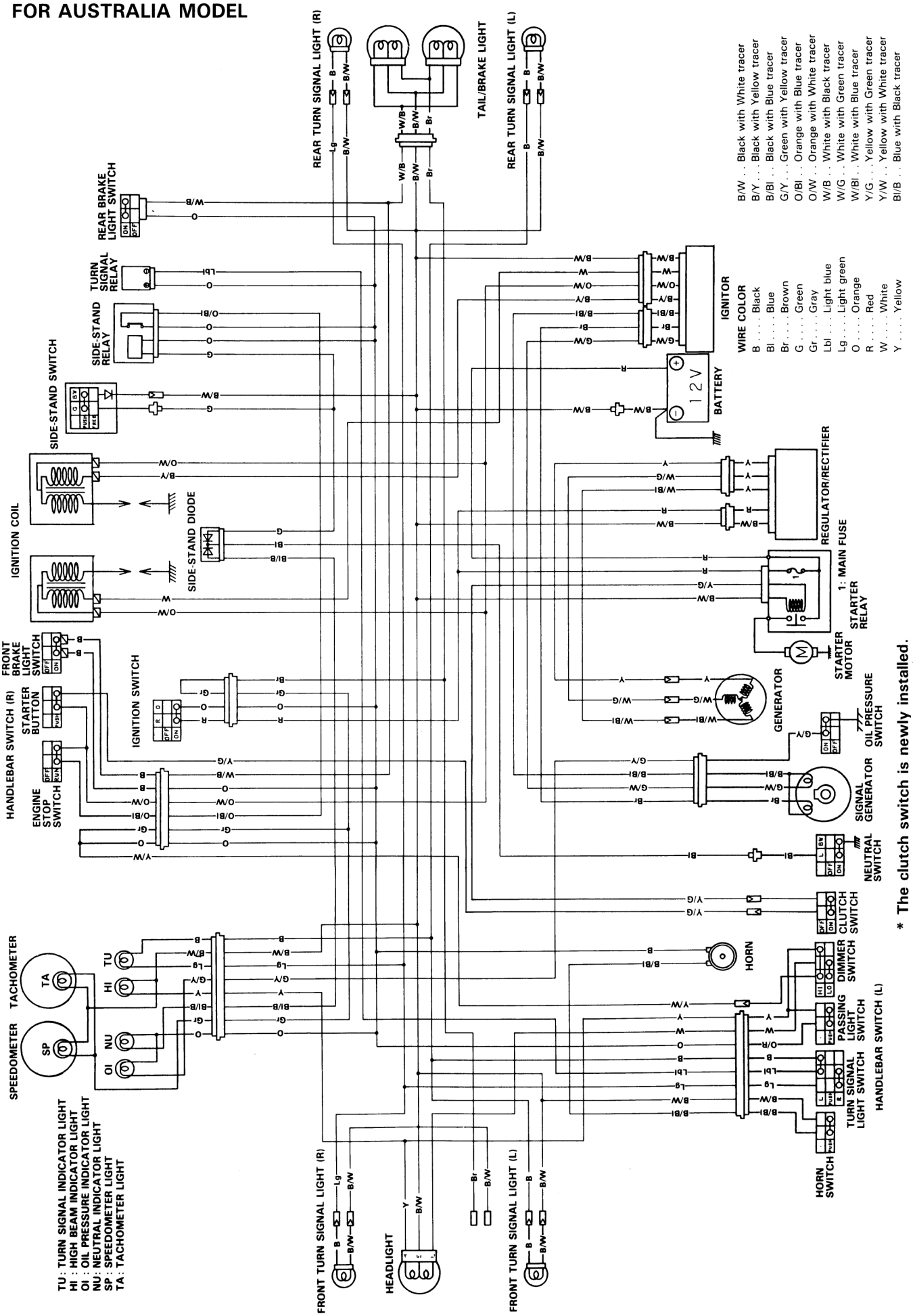


WIRE COLOR

B	Black
L	Blue
Br	Brown
G	Green
Gr	Gray
Sb	Light blue
Lg	Light green
O	Orange
R	Red
W	White
Y	Yellow

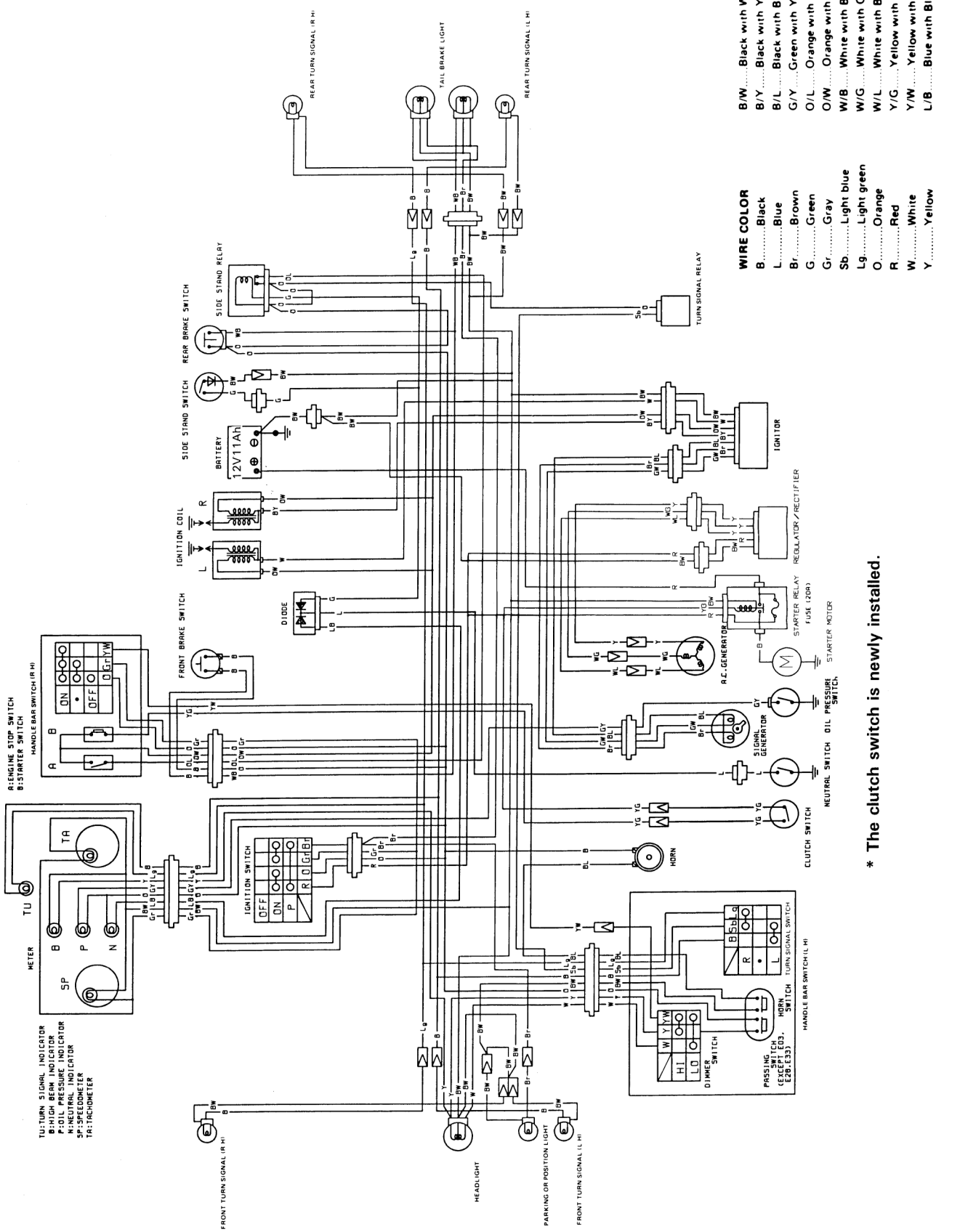
B/W	Black with White tracer
B/Y	Black with Yellow tracer
B/L	Black with Blue tracer
G/Y	Green with Yellow tracer
O/L	Orange with Blue tracer
O/W	Orange with White tracer
W/B	White with Black tracer
W/G	White with Green tracer
W/L	White with Blue tracer
Y/G	Yellow with Green tracer
Y/W	Yellow with White tracer
L/B	Blue with Black tracer

FOR AUSTRALIA MODEL


REAR TURN SIGNAL LIGHT (R)
TAIL/BRAKE LIGHT
REAR TURN SIGNAL LIGHT (L)
REAR BRAKE LIGHT SWITCH
TURN SIGNAL RELAY
SIDE-STAND RELAY
SIDE-STAND SWITCH
IGNITOR
WIRE COLOR
B . . . . Black
Bl . . . . Blue
Br . . . . Brown
G . . . . Green
Gr . . . . Gray
Lbl . . . Light blue
Lg . . . Light green
O . . . . Orange
R . . . . Red
W . . . . White
Y . . . . Yellow
B/W . . Black with White tracer
B/Y . . . Black with Yellow tracer
B/Bl . . Black with Blue tracer
G/Y . . . Green with Yellow tracer
O/Bl . . Orange with Blue tracer
O/W . . Orange with White tracer
W/B . . White with Black tracer
W/G . . White with Green tracer
W/Bl . . White with Blue tracer
Y/G . . . Yellow with Green tracer
Y/W . . Yellow with White tracer
Bl/B . . Blue with Black tracer
BATTERY
12V
IGNITION COIL
SIDE-STAND DIODE
REGULATOR/RECTIFIER
1: MAIN FUSE
STARTER RELAY
STARTER MOTOR
GENERATOR
OIL PRESSURE SWITCH
FRONT BRAKE LIGHT SWITCH
HANDLEBAR SWITCH (R)
STARTER BUTTON
IGNITION SWITCH
ENGINE STOP SWITCH
SIGNAL GENERATOR
NEUTRAL SWITCH
CLUTCH SWITCH
HORN
DIMMER SWITCH
PASSING LIGHT SWITCH
TURN SIGNAL LIGHT SWITCH
HANDLEBAR SWITCH (L)
HORN SWITCH
SPEEDOMETER
TACHOMETER
TU : TURN SIGNAL INDICATOR LIGHT
HI : : HIGH BEAM INDICATOR LIGHT
OI : : OIL PRESSURE INDICATOR LIGHT
NU : NEUTRAL INDICATOR LIGHT
SP : SPEEDOMETER LIGHT
TA : TACHOMETER LIGHT
FRONT TURN SIGNAL LIGHT (R)
HEADLIGHT
FRONT TURN SIGNAL LIGHT (L)

* The clutch switch is newly installed.

FOR OTHER MODELS



* The clutch switch is newly installed.

FOREWORD

This section describes service data, service specifications and servicing procedures which differ from those of the GS500EV ('97-model).

NOTE:
- *Any differences between the GS500EV ('97-model) and GS500EW ('98-model) in specifications and service data are clearly indicated with an asterisk mark (*).*
- *Please refer to the sections 1 through 15 for details which are not given in this section.*

CONTENTS

SPECIFICATIONS ***16- 1***

SERVICE DATA ***16- 2***

PISTON VALVE LIFT CONTROL SYSTEM (FOR E-04 MODEL) . ***16-12***

IGNITION SYSTEM (FOR E-04 MODEL) ***16-15***

SIGNAL GENERATOR (FOR E-04 MODEL) ***16-18***

WIRING DIAGRAM (FOR E-04 MODEL) ***16-20***

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 105 mm (82.9 in) E-25
	2 180 mm (85.8 in) E-18, 22, 39
	2 075 mm (81.7 in) ..... Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs) E-33
	169 kg (372 lbs) ..... Others

ENGINE

Type	Four stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03–0.08 mm (0.0012–0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BSR34, twin E-04
	BST33, twin .... Others
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	* D.I.D. 520VM, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped E-03, 28, 33
	Telescopic, coil spring, oil damped, spring pre-load adjustable .... Others
Rear suspension	Link type, oil damped, spring pre-load 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	25° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disk brake
Rear brake	Disk brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless

ELECTRICAL

Ignition type	Electronic ignition (transistorized)
Ignition timing	5° B.T.D.C. at 1 000 r/min and 40° B.T.D.C. at 4 000 r/min E-33
	12° B.T.D.C. at 1 200 r/min and 40° B.T.D.C. at 4 000 r/min ..... Others
Spark plug	NGK DPR8EA-9 or DENSO W24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W ..... Except E-03, 24, 28, 33
Turn signal light	12V 21W
Brake light/Taillight	12V 21/5W (×2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal) E-33
	17.0 L (4.5/3.7 US/Imp gal) ..... Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) E-03, 28, 33
	377 ml (12.7/13.3 US/Imp oz) ..... Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	—
	EX.	0.040—0.070 (0.0016—0.0028)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789—36.819 (1.4484—1.4496)	36.49 (1.437)
		EX.	36.291—36.321 (1.4288—1.4300)	36.00 (1.417)
	For the others	IN.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
		EX.	36.090—36.130 (1.4208—1.4224)	35.80 (1.409)
Camshaft journal oil clearance		IN. & EX.	0.032—0.066 (0.0013—0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.		IN. & EX.	22.012—22.025 (0.8666—0.8671)	—
Camshaft journal O.D.		IN. & EX.	21.959—21.980 (0.8645—0.8654)	—
Camshaft runout		IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		18th pin		—
Cylinder head distortion		—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			STANDARD	LIMIT
Compression pressure			1 000—1 400 kPa (10—14 kg/cm², 142—199 psi)	800 kPa (8 kg/cm², 114 psi)
Compression pressure difference			—	200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance			0.050—0.060 (0.0020—0.0024)	0.120 (0.0047)
Cylinder bore			74.000—74.015 (2.9134—2.9140)	74.080 (2.9165)
Piston diam.			73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end.	73.880 (2.9087)
Cylinder distortion			—	0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10—0.25 (0.004—0.010)	0.70 (0.028)
	2nd		0.10—0.25 (0.004—0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.21—1.23 (0.047—0.048)	
	2nd	1.21—1.23 (0.047—0.048)	
	Oil	2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st	1.17—1.19 (0.046—0.047)	
	2nd	1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)		18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)		17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	———
Crank pin width	23.10—23.15 (0.909—0.911)	———
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	———
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	———
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	———	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	———
Balancer spring free length	———	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	———
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	———
Clutch release screw	1/4—1/2 turn back	———
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	———	0.10 (0.004)
Clutch spring free length	———	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		———
Final reduction ratio		2.437 (39/16)		———
Gear ratios	Low	2.461 (32/13)		———
	2nd	1.777 (32/18)		———
	3rd	1.380 (29/21)		———
	4th	1.125 (27/24)		———
	5th	0.961 (25/26)		———
	Top	0.851 (23/27)		———
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	———
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	———
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		———
Drive chain		Type	*D.I.D.: DID520VM	———
		Links	110	———
		20-pitch length	———	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		———

CARBURETOR

ITEM		SPECIFICATION			
		E-02,25,34	*E-04	E-18	E-22
Carburetor type		MIKUNI BST33SS	MIKUNI BSR34SS	MIKUNI BST33SS	←
Bore size		33 mm	34 mm	33 mm	←
I.D. No.		02D8	01DB	02D1	02DA
Idle r/min.		1 200 ± 100 r/min.	←	1 300 $^{+100}_{-50}$ r/min.	1 200 ± 100 r/min.
Float height		14.6 ± 1.0 mm	13.0 ± 1.0 mm	14.6 ± 1.0 mm	←
Main jet	(M.J.)	#115	#130	L: #120 R: #115	#115
Jet needle	(J.N.)	5DH9-3rd	5DH25-55-3rd	5DH9-3rd	←
Needle jet	(N.J.)	O-2	P-5	O-2	←
Throttle valve	(Th.V.)	#120	#105	#125	#120
Pilot jet	(P.J.)	#40	#17.5	#40	←
Pilot screw	(P.S.)	PRE-SET (2 turns back)	PRE-SET (2 5/8 turns back)	PRE-SET (1 5/8 turns back)	PRE-SET (2 turns back)
Throttle cable play		3–6 mm (0.1–0.2 in)	←	←	←

CARBURETOR

ITEM		SPECIFICATION			
		E-24	E-28	P-37	P-09
Carburetor type		MIKUNI BST33SS	←	←	←
Bore size		33 mm	←	←	←
I.D. No.		02D6	01D00	02D7	02D50
Idle r/min.		1200 ± 100 r/min.	←	←	←
Float height		14.6 ± 1.0 mm	←	←	←
Main jet	(M.J.)	L: #125 R: #122.5	#122.5	L: #125 R: #122.5	←
Jet needle	(J.N.)	5DH9-3rd	5DH8	5DH9-3rd	←
Needle jet	(N.J.)	O-2	O-3M	O-2	←
Throttle valve	(Th.V.)	#120	←	←	←
Pilot jet	(P.J.)	#40	#37.5	#40	←
Pilot screw	(P.S.)	PRE-SET (1 5/8 turns back)	PRE-SET (2 1/4 turns back)	PRE-SET (1 7/8 turns back)	←
Throttle cable play		3–6 mm (0.1–0.2 in)	←	←	←

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No.		01D00	01DA
Idle r/min.		1200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 122.5	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3M	←
Throttle valve	(Th.V.)	# 120	# 125
Pilot jet	(P.J.)	# 37.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM		SPECIFICATION		
		*E-04 (GS500E-U)	E-22 (GS500E-U)	E-39 (GS500E-U)
Carburetor type		MIKUNI BSR34SS	MIKUNI BST33SS	←
Bore size		34 mm	33 mm	←
I.D. No.		01DC	02DB	02D2
Idle r/min.		1 200 ± 100 r/min.	←	1 200 ± 50 r/min.
Float height		13.0 ± 1.0 mm	14.6 ± 1.0 mm	←
Main jet	(M.J.)	#135	#117.5	L: #125 R: #115
Jet needle	(J.N.)	5DH25-55-3rd	5DH9-2nd	5DH9-3rd
Needle jet	(N.J.)	P-5	O-2	←
Throttle valve	(Th.V.)	#105	#120	#125
Pilot jet	(P.J.)	#17.5	#40	#40
Pilot screw	(P.S.)	PRE-SET (2 5/8 turns back)	PRE-SET (2 turns back)	PRE-SET (1 3/4 turns back)
Throttle cable play		3–6 mm (0.1–0.2 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
		12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order		L • R		
Spark plug		Type	DENSO: X24EPR-U9 NGK: DPR8EA-9	
		Gap	0.8—0.9 (0.031—0.035)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal generator resistance		269.5—404.4 Ω		Only for E-04
		250—420 Ω		For the others
Ignition coil resistance		Primary	3—6 Ω	Terminal—Terminal
		Secondary	18—30 kΩ	Plug cap—Terminal
Signal generator peak voltage		More than 3.0 V		Only for E-04
Ignition coil primary peak voltage		More than 220 V		Only for E-04
Generator Max. output		Approx. 200W at 5 000 r/min.		
Generator no-load voltage		More than 75 V (AC) at 5 000 r/min.		
Regulated voltage		13.5—15.5 V at 5 000 r/min.		
Starter motor brush length		N.D.	Limit: 9 (0.4)	
commutator under-cut		Limit: 0.2 (0.008)		
Starter relay resistance		3—5 Ω		
Battery	Type designation	FB10L-B2		
	Capacity	12V 39.6kC (11Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size		20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Brake light/Taillight		21/5	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		55 (2.2)	—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	—
	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Front	30.230—30.306 (1.1902—1.1931)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	30.150—30.200 (1.1870—1.1890)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	J17 × MT3.00	—
	Rear	J17 × MT3.50	—
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	254 (10.0)	E-03,28,33
	———	303 (11.9)	For the others
Front fork oil level	99 (3.9)	———	E-03,28,33
	105 (4.1)	———	For the others
Rear shock absorber spring adjuster	4th position among 7	———	
Rear wheel travel	115 (4.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

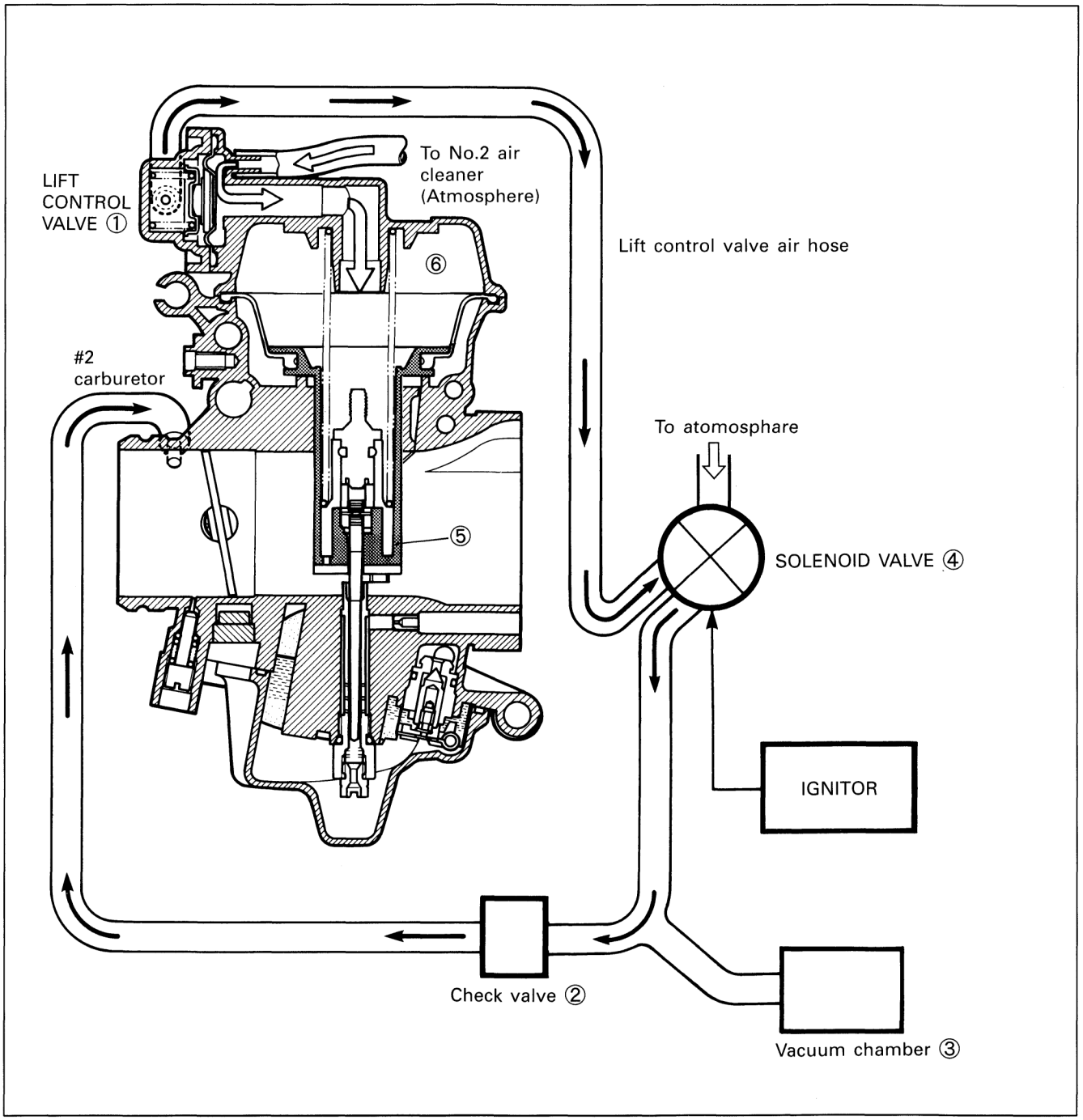
ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

PISTON VALVE LIFT CONTROL SYSTEM (FOR E-04 MODEL)

The piston valve lift control system is added to the carburetor as shown below. The system is consist of the lift control valve ①, check valve (one-way valve) ②, vacuum chamber ③ and solenoid valve ④.

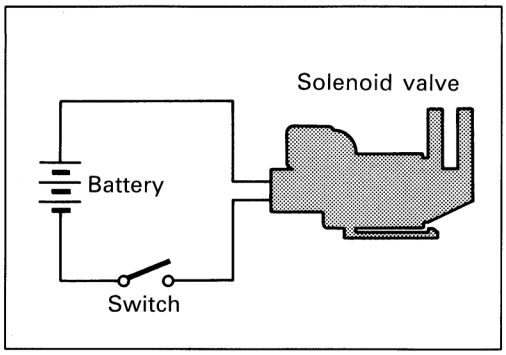
The system controls sudden rising movement of the piston valve ⑤ by controlling the inflow of the atmosphere to the diaphragm chamber ⑥ using the solenoid valve ④ and lift control valve ①.

The negative pressure is taken from #2 carburetor through the check valve ② and stored in the vacuum chamber ③. When the solenoid valve ④ opens the passage from the vacuum chamber to the lift control valve ①, the negative pressure works the diaphragm of the lift control valve, and opens the entrance of the diaphragm chamber ⑥ to the No.2 air cleaner. Then the inflow of the atmosphere reduce the lift of the piston valve ⑤.



SOLENOID VALVE INSPECTION (FOR E-04 MODEL)

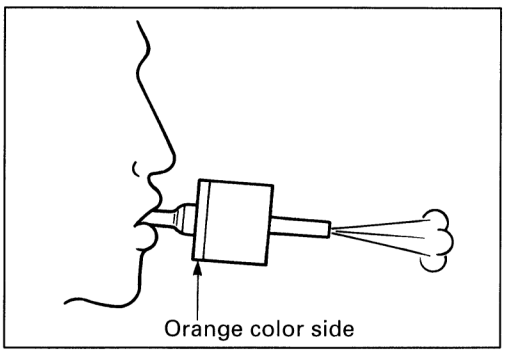
- Connect lead wires from the battery to the terminals in the solenoid valve coupler.
- Check the solenoid valve operation by turning the switch to ON and OFF.
- If the solenoid valve clicks when you turn on, it is in sound condition.



CHECK VALVE INSPECTION (FOR E-04 MODEL)

- Blow the check valve from the Orange color side. If air flow out, it is in sound condition.
- Also, blow the check valve from opposite side. If air does not flow out, it is in sound condition.

If the operation is incorrect, replace the check valve with a new one.

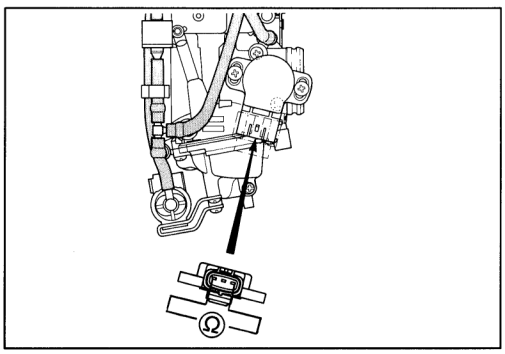


THROTTLE POSITION SENSOR INSPECTION (FOR E-04 MODEL)

Using the tester, measure the resistance between the terminals as shown in the right illustration.

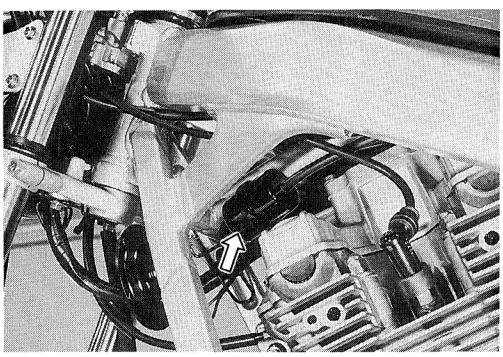
Throttle position sensor resistance: 3.5–6.5 kΩ

NOTE:
When making above test, it is not necessary to remove the throttle position sensor.



VACUUM CHAMBER INSPECTION (FOR E-04 MODEL)

Check the vacuum chamber for damage and flows or scratches, and replace it if necessary.

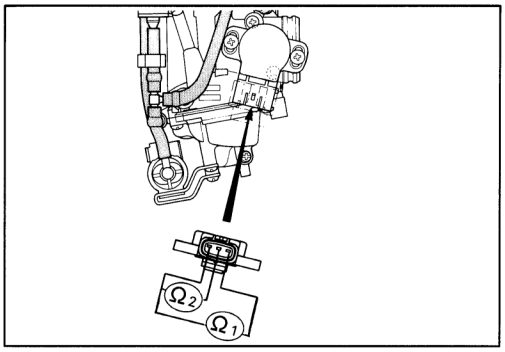


THROTTLE POSITION SENSOR POSITIONING (FOR E-04 MODEL)

When removing the throttle position sensor from the carburetor body, install it to the exact position mentioned below;

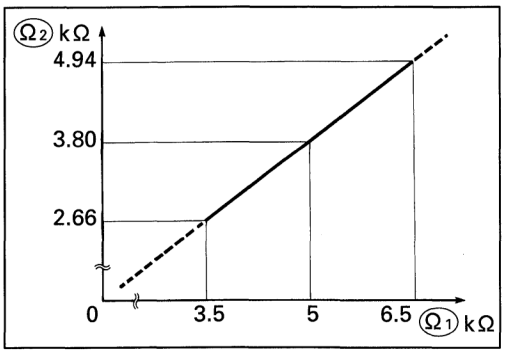
- Measure the resistance Ω1 between terminals of the throttle position sensor as shown in the right illustration.

Throttle position sensor resistance Ω1: 3.5–6.5 kΩ



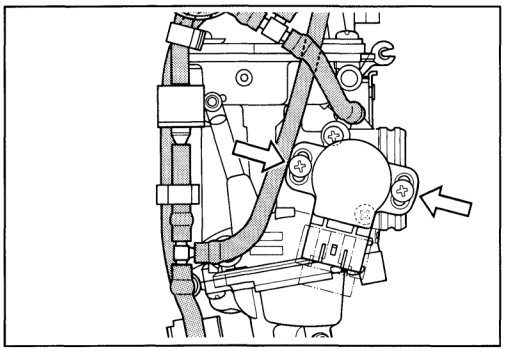
- Measure the resistance Ω2 between terminals of the throttle position sensor as shown in the right illustration.
- Open the throttle valve fully by turning the throttle lever.
- Under above condition, see the throttle position sensor angle to have the resistance Ω2 as 76% of the resistance Ω1.

For example: When Ω1 is 5 kΩ, Ω2 should be 3.8 kΩ.



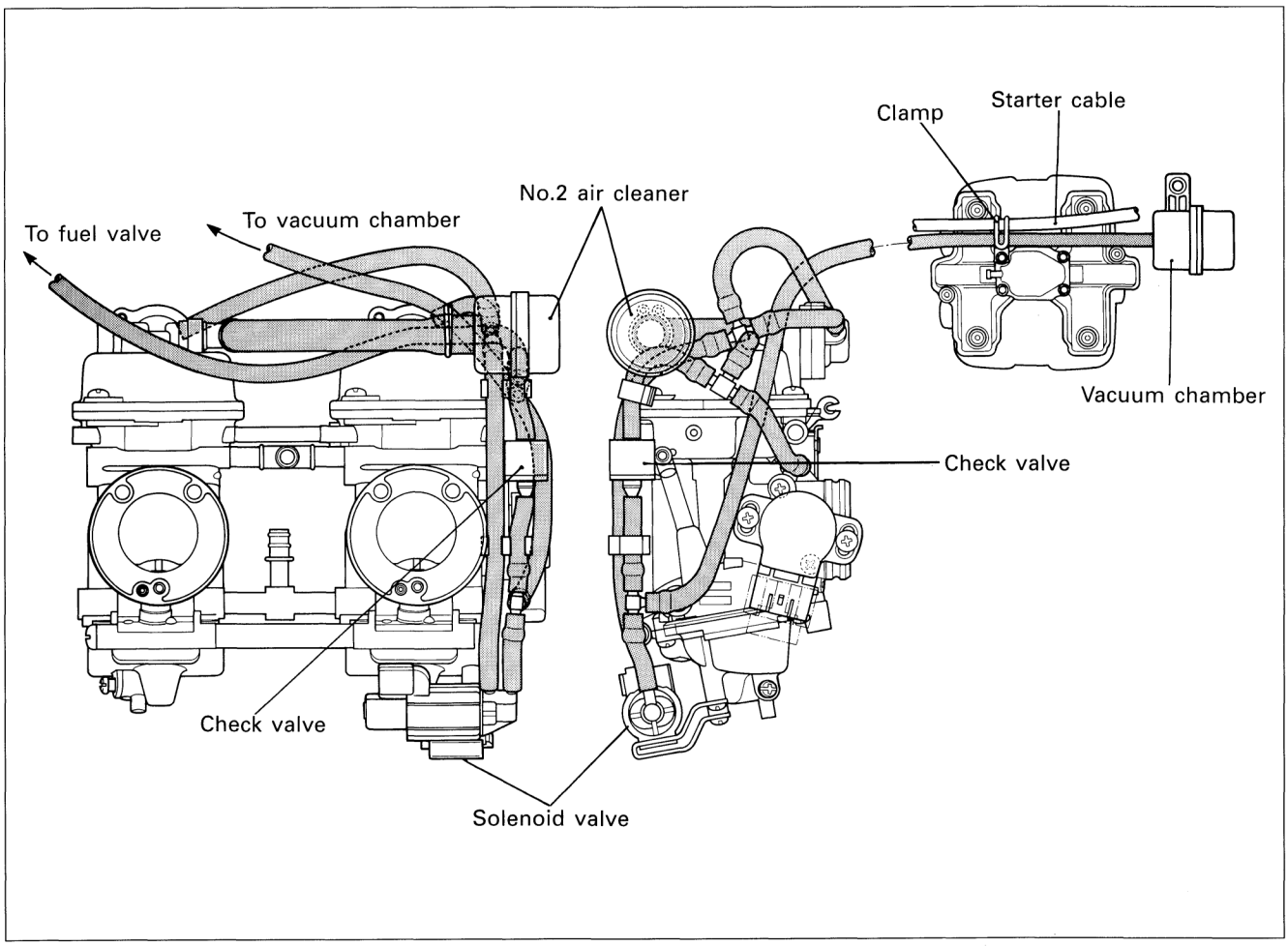
- When reading the above-mentioned resistance as Ω2, tighten the throttle position sensor mounting screws to the specified torque.

Throttle position sensor mounting screw:
3.5 N·m (0.35 kg-m, 2.5 lb-ft)



PISTON VALVE LIFT CONTROL SYSTEM PARTS (FOR E-04 MODEL)

Connect the solenoid valve ①, the vacuum chamber ② and the check valve ③ as shown in the following illustration.



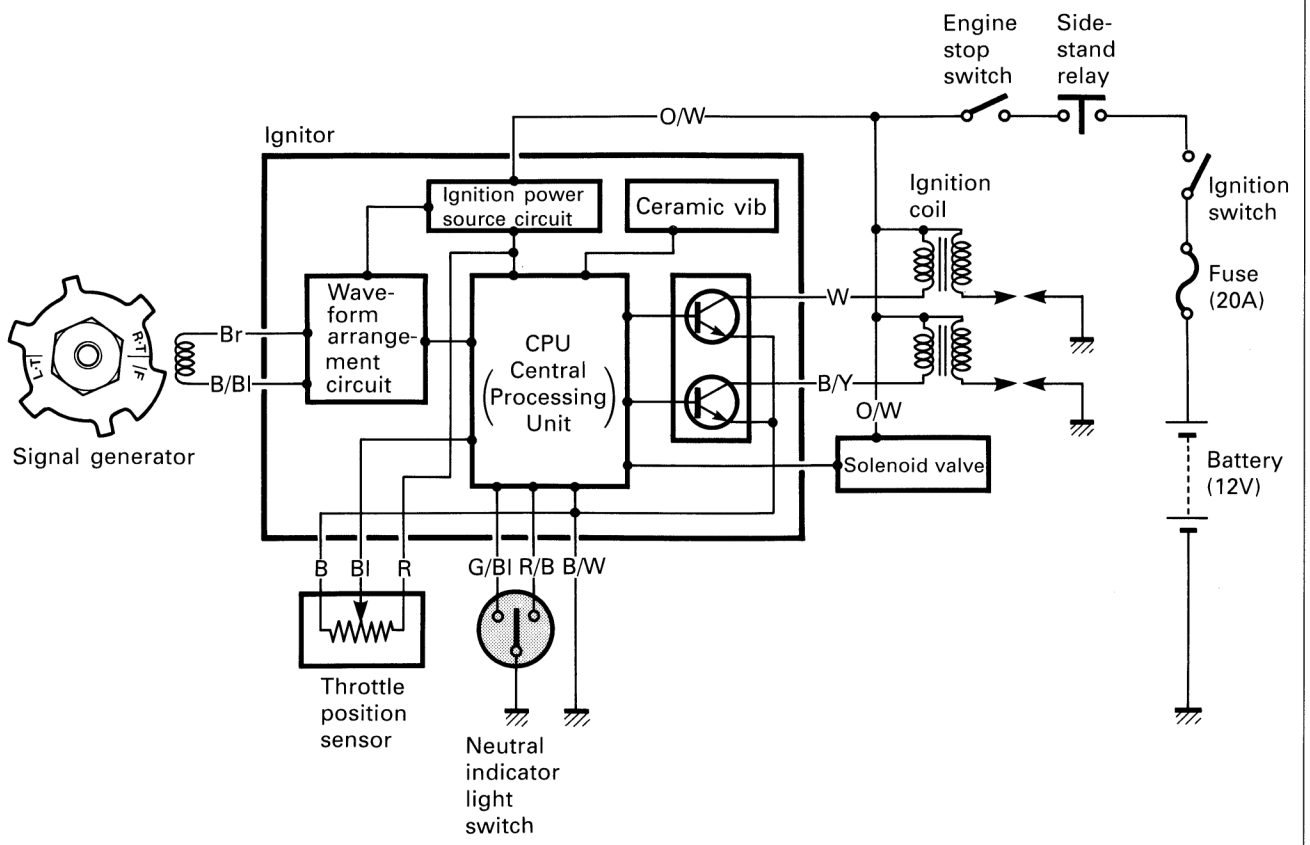
IGNITION SYSTEM (FOR E-04 MODEL)

DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor unit (including 8-BIT MICROCOMPUTER and CERAMIC 8MHZ VIBRATOR), ignition coils and spark plugs.

The signal generator mounted at the right end of the crankshaft comprises the rotor tip and pickup coil.

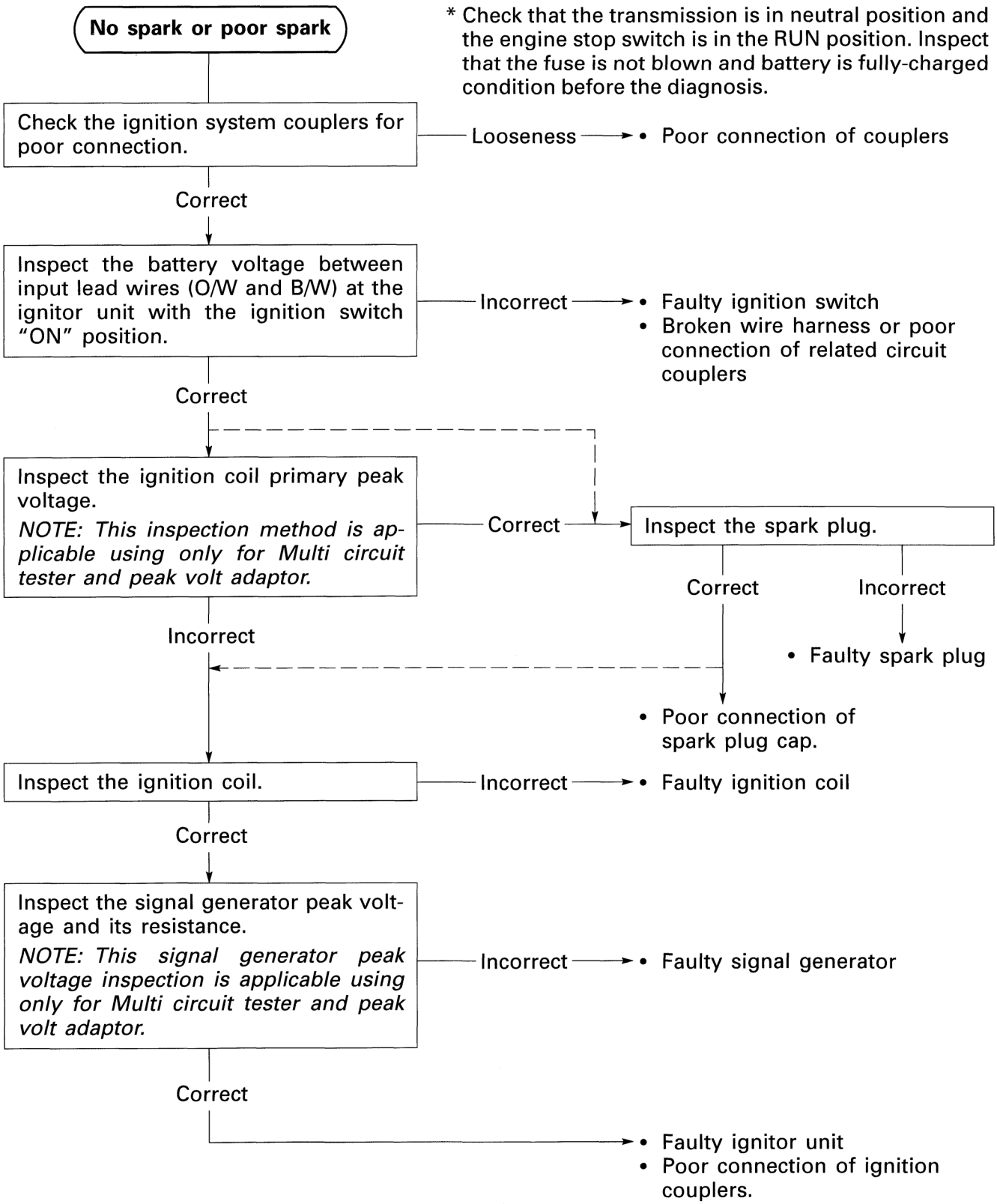
The induced signal in the signal generator is sent to wave-form arrangement circuit, and CPU receives this signal and calculates the best ignition timing from the signal of ceramic vibrator. The CPU outputs signal to the transistor of the I.G. coil output circuit which is connected to the primary windings of the ignition coil which is turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.



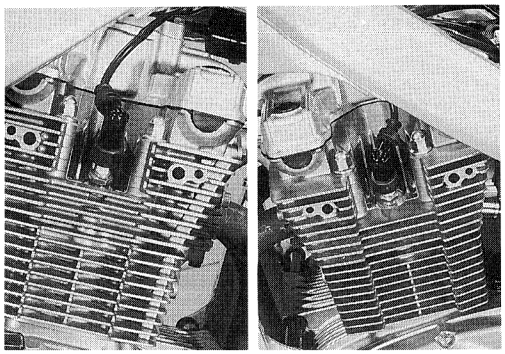
WIRE COLOR

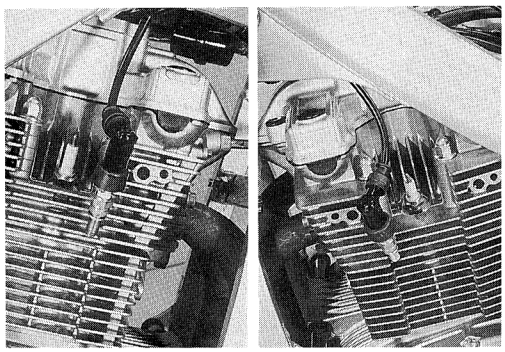
B	Black
Bl	Blue
Br	Brown
R	Red
W	White
B/Bl	Black with Blue tracer
B/Y	Black with Yellow tracer
B/W	Black with White tracer
G/Bl	Green with Blue tracer
O/W	Orange with White tracer
R/B	Red with Black tracer

TROUBLESHOOTING (FOR E-04 MODEL)


No spark or poor spark
* Check that the transmission is in neutral position and the engine stop switch is in the RUN position. Inspect that the fuse is not blown and battery is fully-charged condition before the diagnosis.
Check the ignition system couplers for poor connection.
Looseness
• Poor connection of couplers
Correct
Inspect the battery voltage between input lead wires (O/W and B/W) at the ignitor unit with the ignition switch "ON" position.
Incorrect
• Faulty ignition switch
• Broken wire harness or poor connection of related circuit couplers
Correct
Inspect the ignition coil primary peak voltage.
NOTE: This inspection method is applicable using only for Multi circuit tester and peak volt adaptor.
Correct
Inspect the spark plug.
Correct
Incorrect
• Faulty spark plug
Incorrect
• Poor connection of spark plug cap.
Inspect the ignition coil.
Incorrect
• Faulty ignition coil
Correct
Inspect the signal generator peak voltage and its resistance.
NOTE: This signal generator peak voltage inspection is applicable using only for Multi circuit tester and peak volt adaptor.
Incorrect
• Faulty signal generator
Correct
• Faulty ignitor unit
• Poor connection of ignition couplers.

IGNITION COIL PRIMARY PEAK VOLTAGE (FOR E-04 MODEL)

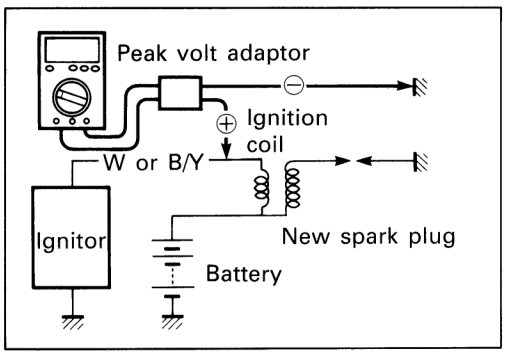




- Remove the fuel tank.
- Remove the two spark plug caps.
- Connect new two spark plugs to each spark plug cap and ground them.

NOTE:
Be sure that all couplers and spark plugs are connected properly and the battery is in fully-charged condition.

Inspect the No.1 ignition coil primary peak voltage in the following procedure.



- Connect the tester with peak voltage adaptor as follow.

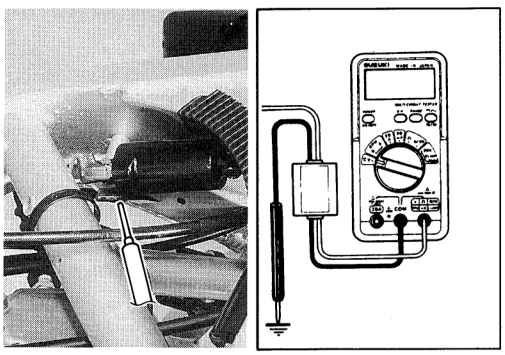
No.1 ignition coil: White terminal – Ground
(⊕ Probe) (⊖ Probe)

NOTE:
Do not disconnect the ignition coil primary wire.

TOOL 09900-25008: Multi circuit tester set
(Except for European market)

⚠ CAUTION

When using the multi circuit tester and peak volt adaptor, follow the instruction manual.



- Shift the transmission into the neutral.
- Turn the ignition switch to the "ON" position.
- Squeeze the clutch lever.
- Crank the engine a few seconds with starter motor by depressing starter button and then check the ignition coil primary peak voltage.
- Repeat the above inspection a few times and measure the highest ignition coil primary peak voltage.

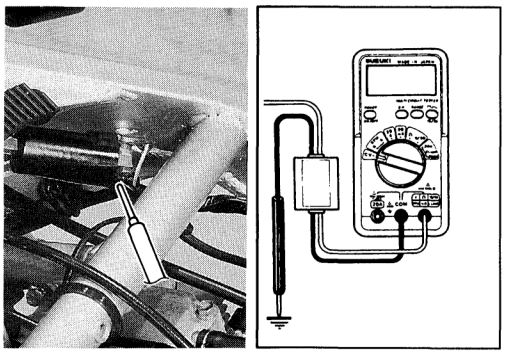
Tester knob indication: Voltage (⎓)

Ignition coil primary peak voltage: More than 220 V

⚠WARNING

Do not touch the tester probes and spark plugs to prevent an electric shock while testing.

Inspect the No.2 ignition coil primary peak voltage in the same manner of No.1 ignition coil inspection.
No.2 ignition coil: B/Y terminal – Ground
(⊕ Probe) (⊖ Probe)
B/Y: Black with Yellow tracer



NOTE:
Do not disconnect the ignition coil primary wire.

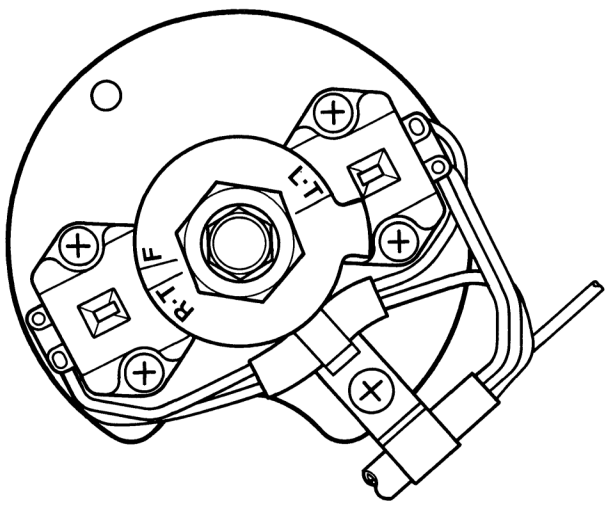
Tester knob indication: Voltage (⎓)

Ignition coil primary peak voltage: More than 220 V

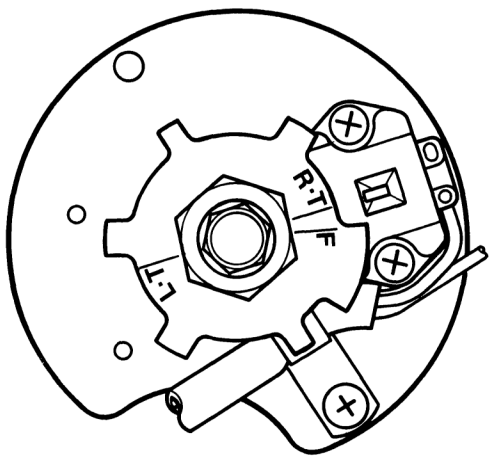
If they are lower than the specified values, inspect the ignition coil, signal generator and ignitor.

SIGNAL GENERATOR (FOR E-04 MODEL)

The signal generator rotor and stator have been changed as follows.



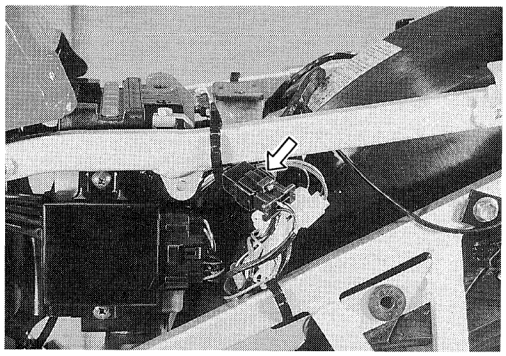
(E-04, '97-MODEL)



(E-04, '98-MODEL)

NOTE:
At above condition, the right cylinder is at the Top Dead Center (TDC). When checking the tappet clearance and assembling the camshafts, the signal generator rotor must be at this position.

SIGNAL GENERATOR PEAK VOLTAGE (FOR E-04 MODEL)



- Remove the frame cover.
- Disconnect the signal generator lead wire coupler.

NOTE:
Be sure that all couplers are connected properly and the battery is in fully-charged condition.

Inspect the signal generator peak voltage between Brown and B/Bl lead wires on the signal generator lead wire coupler.

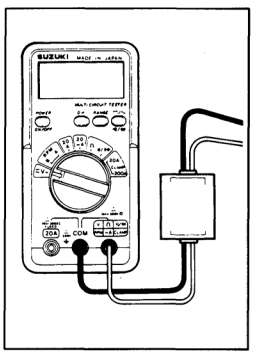
- Connect the tester with peak volt adaptor as follow.

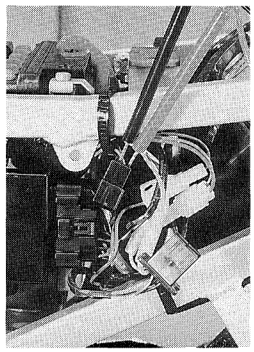
Brown (⊕ Probe) – B/Bl (⊖ Probe)
B/Bl: Black with Blue tracer

TOOL 09900-25008: Multi circuit tester set (Except for European market)

⚠ CAUTION

When using multi circuit tester and peak volt adaptor, follow the instruction manual.

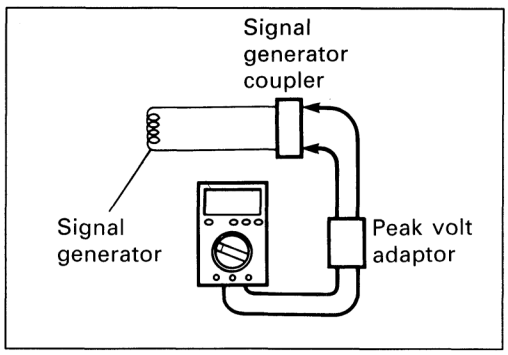




- Shift the transmission into the neutral.
- Turn the ignition switch to the "ON" position.
- Squeeze the clutch lever.
- Crank the engine a few seconds with starter motor by depressing starter button and then check the signal generator peak voltage.
- Repeat the above test procedure a few times and measure the highest signal generator peak voltage.

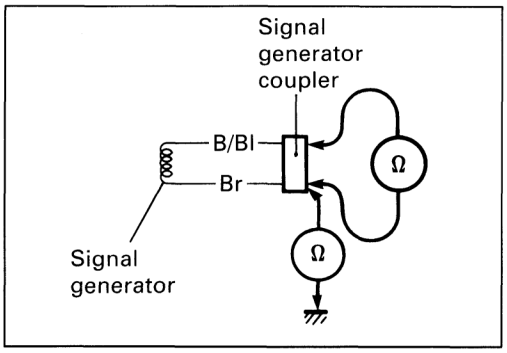
Tester knob indication: Voltage (⎓)

Signal generator peak voltage:
More than 3.0V (Br–B/Bl)



If the peak voltage on the signal generator lead wire coupler is abnormal, the signal generator must be replaced and recheck.

SIGNAL GENERATOR RESISTANCE (FOR E-04 MODEL)

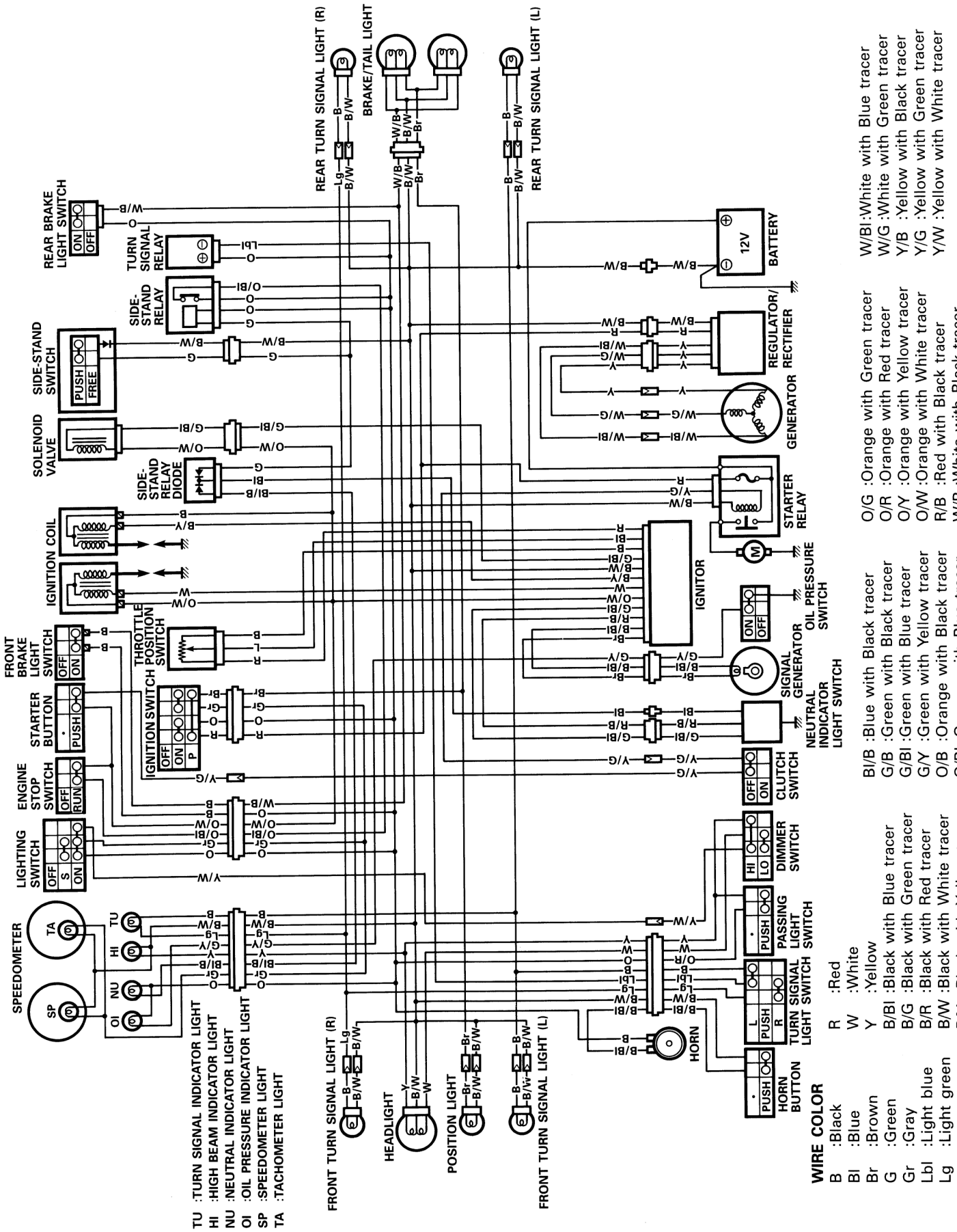


- Remove the frame cover and disconnect the signal generator lead wire coupler.
- Measure the resistance between lead wires and ground. If the resistance is not specified value, the signal coil must be replaced.

Signal coil resistance: 269.6–404.4Ω (Br–B/Bl)
∞ Ω (Br–Ground)

WIRING DIAGRAM

FOR E-04 MODEL



GS500EX ('99-MODEL)

CONTENTS

SPECIFICATIONS 17- 1

SERVICE DATA 17- 2

NOTE:

The specifications and service data are the same as W-MODEL.

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 105 mm (82.9 in) E-25
	2 180 mm (85.8 in) E-18, 22, 39
	2 075 mm (81.7 in) ..... Others
Overall width	745 mm (29.3 in)
Overall height	1 045 mm (41.1 in)
Wheelbase	1 410 mm (55.5 in)
Ground clearance	155 mm (6.1 in)
Seat height	790 mm (31.1 in)
Dry mass	170 kg (374 lbs) E-33
	169 kg (372 lbs) ..... Others

ENGINE

Type	Four stroke, air-cooled, DOHC
Valve clearance (IN & EX)	0.03–0.08 mm (0.0012–0.0031 in)
Number of cylinders	2
Bore	74.0 mm (2.913 in)
Stroke	56.6 mm (2.228 in)
Displacement	487 cm^3 (29.7 cu. in)
Compression ratio	9.0 : 1
Carburetor	BSR34, twin E-04
	BST33, twin ..... Others
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	6-speed constant mesh
Gearshift pattern	1-down, 5-up
Primary reduction ratio	2.714 (76/28)
Gear ratios, Low	2.461 (32/13)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
Top	0.851 (23/27)
Final reduction ratio	2.437 (39/16)
Drive chain	D.I.D. 520VM, 110 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped E-03, 28, 33
	Telescopic, coil spring, oil damped, spring preload adjustable .... Others
Rear suspension	Link type, oil damped, spring preload 7-way adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	115 mm (4.5 in)
Caster	25° 30'
Trail	95 mm (3.7 in)
Steering angle	35°
Turning radius	2.7 m (8.9 ft)
Front brake	Disk brake
Rear brake	Disk brake
Front tire size	110/70-17 54H, tubeless
Rear tire size	130/70-17 62H, tubeless

ELECTRICAL

Ignition type	Electronic ignition (transistorized)
Ignition timing	5° B.T.D.C. at 1 000 r/min and 40° B.T.D.C. at 4 000 r/min E-33
	12° B.T.D.C. at 1 200 r/min and 40° B.T.D.C. at 4 000 r/min ..... Others
Spark plug	NGK DPR8EA-9 or DENSO X24EPR-U9
Battery	12V 39.6 kC (11 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W ..... Except E-03, 24, 28, 33
Turn signal light	12V 21W
Brake light/Taillight	12V 21/5W (×2 pcs.)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 1.7W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W

CAPACITIES

Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal) E-33
	17.0 L (4.5/3.7 US/Imp gal) ..... Others
reserve	3.5 L (0.9/0.8 US/Imp gal)
Engine oil, without filter change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 200 ml (3.4/2.8 US/Imp qt)
Front fork oil (each leg)	382 ml (12.9/13.5 US/Imp oz) E-03, 28, 33
	377 ml (12.7/13.3 US/Imp oz) ..... Others

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	39 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.5 (0.33)	—
	EX.	8.0 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	—
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0010—0.0022)	—
	EX.	0.040—0.070 (0.0016—0.0028)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	—
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	—
	EX.	6.945—6.960 (0.2734—0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.6 (1.40)
	OUTER	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	INNER	10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in)	—
	OUTER	20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		LIMIT
Cam height	E-03,18, 24,28,33	IN.	36.789–36.819 (1.4484–1.4496)	36.49 (1.437)
		EX.	36.291–36.321 (1.4288–1.4300)	36.00 (1.417)
	For the others	IN.	36.090–36.130 (1.4208–1.4224)	35.80 (1.409)
		EX.	36.090–36.130 (1.4208–1.4224)	35.80 (1.409)
Camshaft journal oil clearance		IN. & EX.	0.032–0.066 (0.0013–0.0026)	0.150 (0.0060)
Camshaft journal holder I.D.		IN. & EX.	22.012–22.025 (0.8666–0.8671)	—
Camshaft journal O.D.		IN. & EX.	21.959–21.980 (0.8645–0.8654)	—
Camshaft runout		IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		18th pin		—
Cylinder head distortion		—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 000–1 400 kPa (10–14 kg/cm², 142–199 psi)			800 kPa (8 kg/cm², 114 psi)
Compression pressure difference	—			200 kPa (2 kg/cm², 28 psi)
Piston to cylinder clearance	0.050–0.060 (0.0020–0.0024)			0.120 (0.0047)
Cylinder bore	74.000–74.015 (2.9134–2.9140)			74.080 (2.9165)
Piston diam.	73.945–73.960 (2.9112–2.9118) Measure at 15 mm (0.6 in) from the skirt end.			73.880 (2.9087)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	N	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10–0.25 (0.004–0.010)	0.70 (0.028)
	2nd		0.10–0.25 (0.004–0.010)	0.70 (0.028)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)

ITEM	STANDARD		LIMIT
Piston ring groove width	1st	1.21—1.23 (0.047—0.048)	
	2nd	1.21—1.23 (0.047—0.048)	
	Oil	2.51—2.53 (0.099—0.100)	
Piston ring thickness	1st	1.17—1.19 (0.046—0.047)	
	2nd	1.17—1.19 (0.046—0.047)	
Piston pin bore	18.002—18.008 (0.7087—0.7090)		18.030 (0.7098)
Piston pin O.D.	17.995—18.000 (0.7085—0.7087)		17.980 (0.7079)

CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod big end side clearance	0.1—0.2 (0.004—0.008)	0.3 (0.012)
Conrod big end width	22.95—23.00 (0.904—0.906)	—
Crank pin width	23.10—23.15 (0.909—0.911)	—
Conrod big end oil clearance	0.024—0.048 (0.0009—0.0019)	0.080 (0.0031)
Crank pin O.D.	33.976—34.000 (1.3376—1.3386)	—
Crankshaft journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Crankshaft journal O.D.	31.976—32.000 (1.2589—1.2598)	—
Crankshaft thrust bearing thickness	2.950—2.975 (0.1161—0.1171)	2.850 (0.1122)
Crankshaft runout	—	0.05 (0.002)
Balancer journal oil clearance	0.020—0.044 (0.0008—0.0017)	0.080 (0.0031)
Balancer journal O.D.	31.984—32.000 (1.2592—1.2598)	—
Balancer spring free length	—	14.9 (0.59)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.879 (76/28 x 27/39)	—
Oil pressure (at 60°C,140°F)	Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch lever play	10—15 (0.4—0.6)	—
Clutch release screw	1/4—1/2 turn back	—
Drive plate thickness	2.92—3.08 (0.115—0.121)	2.62 (0.103)
Drive plate claw width	15.8—16.0 (0.62—0.63)	15.0 (0.59)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	60.8 (2.39)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		2.714 (76/28)		—
Final reduction ratio		2.437 (39/16)		—
Gear ratios	Low	2.461 (32/13)		—
	2nd	1.777 (32/18)		—
	3rd	1.380 (29/21)		—
	4th	1.125 (27/24)		—
	5th	0.961 (25/26)		—
	Top	0.851 (23/27)		—
Shift fork to groove clearance		0.1—0.3 (0.004—0.012)		0.5 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.5—5.6 (0.217—0.220)	—
Shift fork thickness		No.1, No.2 & No.3	5.3—5.4 (0.209—0.213)	—
Countershaft length (Low to 2nd)		$114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$		—
Drive chain		Type	D.I.D.: DID520VM	—
		Links	110	—
		20-pitch length	—	319.4 (12.57)
Drive chain slack		20—30 (0.8—1.2)		—

CARBURETOR

ITEM	SPECIFICATION			
	E-02,25,34,54	E-04	E-18	E-22
Carburetor type	MIKUNI BST33SS	MIKUNI BSR34SS	MIKUNI BST33SS	←
Bore size	33 mm	34 mm	33 mm	←
I.D. No	02D8	01DB	02D1	02DA
Idle r/min.	1 200 ± 100 r/min.	←	1 300 $^{+100}_{-50}$ r/min.	1 200 ± 100 r/min.
Float height	14.6 ± 1.0 mm	13.0 ± 1.0 mm	14.6 ± 1.0 mm	←
Main jet (M.J.)	#115	#130	L: 120 R: 115	#115
Jet needle (J.N.)	5DH9-3rd	5DH25-55-3rd	5DH9-3rd	←
Needle jet (N.J.)	O-2	P-5	O-2	←
Throttle valve (Th.V.)	#120	#105	#125	#120
Pilot jet (P.J.)	#40	#17.5	#40	←
Pilot screw (P.S.)	PRE-SET (2 turns back)	PRE-SET (2⅝ turns back)	PRE-SET (1⅝ turns back)	PRE-SET (2 turns back)
Throttle cable play	3—6 mm (0.1—0.2 in)	←	←	←

CARBURETOR

ITEM	SPECIFICATION		
	E-24	E-28	P-37
Carburetor type	MIKUNI BST33SS	←	←
Bore size	33 mm	←	←
I.D. No.	02D6	01D00	02D7
Idle r/min.	1200 ± 100 r/min.	←	←
Float height	14.6 ± 1.0 mm	←	←
Main jet (M.J.)	L: #125 R: #122.5	#122.5	L: #125 R: #122.5
Jet needle (J.N.)	5DH9-3rd	5DH8	5DH9-3rd
Needle jet (N.J.)	O-2	O-3M	O-2
Throttle valve (Th.V.)	#120	←	←
Pilot jet (P.J.)	#40	#37.5	#40
Pilot screw (P.S.)	PRE-SET (1⅝ turns back)	PRE-SET (2¼ turns back)	PRE-SET (1⅞ turns back)
Throttle cable play	3—6 mm (0.1—0.2 in)	←	←

CARBURETOR

ITEM		SPECIFICATION	
		E-03	E-33
Carburetor type		MIKUNI BST33SS	←
Bore size		33 mm	←
I.D. No.		01D00	01DA
Idle r/min.		1200 ± 100 r/min.	←
Float height		14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 122.5	←
Jet needle	(J.N.)	5DH8	←
Needle jet	(N.J.)	O-3M	←
Throttle valve	(Th.V.)	# 120	# 125
Pilot jet	(P.J.)	# 37.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle cable play		3—6 mm (0.1—0.2 in)	←

CARBURETOR

ITEM		SPECIFICATION		
		E-04 (GS500E-U)	E-22 (GS500E-U)	E-39 (GS500E-U)
Carburetor type		MIKUNI BSR34SS	MIKUNI BST33SS	←
Bore size		34 mm	33 mm	←
I.D. No.		01DC	02DB	02D2
Idle r/min.		1200 ± 100 r/min.	←	1200 ± 50 r/min.
Float height		13.0 ± 1.0 mm	14.6 ± 1.0 mm	←
Main jet	(M.J.)	# 135	# 117.5	L: # 125 R: # 115
Jet needle	(J.N.)	5DH25-55-3rd	5DH9-2nd	5DH9-3rd
Needle jet	(N.J.)	P-5	O-2	←
Throttle valve	(Th.V.)	# 105	# 120	# 125
Pilot jet	(P.J.)	# 17.5	# 40	# 40
Pilot screw	(P.S.)	PRE-SET (2⅝ turns back)	PRE-SET (2 turns back)	PRE-SET (1¾ turns back)
Throttle cable play		3—6 mm (0.1—0.2 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	5° B.T.D.C. at 1 000 r/min. 40° B.T.D.C. at 4 000 r/min.		E-33
	12° B.T.D.C. at 1 200 r/min. 40° B.T.D.C. at 4 000 r/min.		For the others
Firing order	L • R		
Spark plug	Type	DENSO: X24EPR-U9 NGK: DPR8EA-9	
	Gap	0.8—0.9 (0.031—0.035)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal generator resistance	269.5—404.4 Ω		Only for E-04
	250—420 Ω		For the others
Ignition coil resistance	Primary	3—6 Ω	Terminal—Terminal
	Secondary	18—30 kΩ	Plug cap—Terminal
Signal generator peak voltage	More than 3.0 V		Only for E-04
Ignition coil primary peak voltage	More than 220 V		Only for E-04
Generator Max. output	Approx. 200W at 5 000 r/min.		
Generator no-load voltage	More than 75 V (AC) at 5 000 r/min.		
Regulated voltage	13.5—15.5 V at 5 000 r/min.		
Starter motor brush length	N.D.	Limit: 9 (0.4)	
commutator under-cut	Limit: 0.2 (0.008)		
Starter relay resistance	3—5 Ω		
Battery Type designation	FB10L-B2		
Capacity	12V 39.6kC (11Ah)/10HR		
Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size	20 A		

WATTAGE

Unit:W

ITEM		SPECIFICATION	
		E-03,24,28,33	The others
Headlight	HI	60	←
	LO	55	←
Position light			4
Brake light/Taillight		21/5	←
Turn signal light		21	←
Tachometer light		3.4	←
Speedometer light		3.4	←
Turn signal indicator light		3.4	←
High beam indicator light		1.7	←
Neutral indicator light		3.4	←
Oil pressure indicator light		3.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700—12.743 (0.5000—0.5017)	—
	Rear	12.700—12.743 (0.5000—0.5017)	—
Master cylinder piston diam.	Front	12.657—12.684 (0.4983—0.4994)	—
	Rear	12.657—12.684 (0.4983—0.4994)	—
Brake caliper cylinder bore	Front	30.230—30.306 (1.1902—1.1931)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	30.150—30.200 (1.1870—1.1890)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	J17 × MT3.00	—
	Rear	J17 × MT3.50	—
Tire size	Front	110/70-17 54H	—
	Rear	130/70-17 62H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	254 (10.0)	E-03,28,33
	———	303 (11.9)	For the others
Front fork oil level	99 (3.9)	———	E-03,28,33
	105 (4.1)	———	For the others
Rear shock absorber spring adjuster	4th position among 7	———	
Rear wheel travel	115 (4.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	• Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. • Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.		E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.		For the others
Fuel tank including reserve	15.0 L (4.0/3.3 US/Imp gal)		E-33
	17.0 L (4.5/3.7 US/Imp gal)		For the others
reserve	3.5 L (0.9/0.8 US/Imp gal)		
Engine oil type	SAE 10W/40, API SF or SG		
Engine oil capacity	Change	2 600 ml (2.7/2.3 US/Imp qt)	
	Filter change	2 900 ml (3.1/2.6 US/Imp qt)	
	Overhaul	3 200 ml (3.4/2.8 US/Imp qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	382 ml (12.9/13.5 US/Imp oz)		E-03,28,33
	377 ml (12.7/13.3 US/Imp oz)		For the others
Brake fluid type	DOT 4		

Prepared by

SUZUKI MOTOR CORPORATION

Motorcycle Service Department
10th Ed. March, 1999
1st Ed. March, 1989
Part No. 99500-34069-01E
Printed in Japan

SUZUKI MOTOR CORPORATION

Printed in Japan (TK)
K L M N P R S T V W X